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THE HIGH SCHOOL DEPARTMENT.

THE opening session of this Department was held in the Auditorium of the Greensburg High School, on Tuesday, July 2, at 9 o'clock, Prof. J. H. Breidinger in the chair.

The first paper in order was that of Prof. C. H. Pennypacker, of York, as follows:

THE HIGH SCHOOL PRINCIPAL'S DUTIES—FROM THE PRINCIPAL'S POINT OF VIEW.

The nature of the subject and the limited length of this paper will necessarily make the discussion suggestive rather than exhaustive, and I wish that you would so consider it.

The duties of a high school principal are manifold and not fully understood by many persons either in school or out of it. These duties may readily be classified as duties to pupils, duties to teachers, duties to school authorities, duties to parents and duties to the community. This classification covers the duties of a principal as a participant in the regulations pertaining to his school, as an arbiter in many school affairs and as the executive officer of the school over which he presides.

In speaking of the relations of a principal to his scholars, I shall begin with an apparently impractical, but very necessary duty—that of a personal acquaintance with every pupil in his school. To know the home life, the social life and the previous school life of so many pupils is a tedious task; for without this knowledge, gained directly and by the assistance of others, we are not in a position to successfully direct and supervise the educational welfare of those committed to our care.

Without an intimate knowledge of the previous history of our pupils we are not qualified to properly advise and to help pupils in the early stages of their high school work, when many pupils go wrong in the adjustment of their former school experience to the first year in the high school—a critical and testing period for high school pupils. Too many failures in this year's work are due, in part, to this transition in school work and the want of a more intimate knowledge of the needs of the pupils concerned.

It is distressing to trace and to note the number of pupils who are misjudged and discouraged by indiscreet teachers and principals who are not properly and anxiously acquainted with their pupils, either because they do not understand the nature of young people and their needs as founded upon their experience, or because they lack the desired knowledge under discussion.

The educational process is the proper adjustment of pupils to their environment in school, and out of it—as far as practical—to offset wrong tendencies and to inspire and instill correct ones. In this adjustment and direction of pupils the principal plays an important part in the formation of courses of study and in the interpretation of the policy of the school, for which he is and should be largely responsible.

The working conditions of the school being educationally correct, and well known by teachers and by pupils, it is not to be

supposed that all will maintain a right relation to them in the pursuit of their work. Individual pupils will constantly go wrong both in work and in conduct. To keep in close touch with such pupils, to discuss and to discover the causes of failure, especially when the teachers directly concerned fail to discover and to correct such mistakes, is a most important and imperative duty of a principal. With the advice and assistance of teachers, the principal should be able to advise and to assist both teachers and pupils in overcoming the difficulties and mistakes of both. How often, be it said to our discredit professionally, do we, as teachers, fail to help pupils in their work and conduct, because of a wrong professional attitude, and because we are personally responsible for inviting trouble and for influencing pupils in an unfortunate manner—failing to correct in ourselves what we frequently and vigorously denounce in them. Believing, as I am reluctantly obliged to do, that many of our difficulties with pupils and their failures are traceable to ourselves as teachers, the correction and adjustment of these matters is a fruitful field in the successful management of a school.

To have and to hold the confidence of teachers and pupils, so that they will seek the advice of the principal in the correction of unintentional mistakes, it may be, which do not yield to correction between teacher and pupils, is the proper attitude for successful and pleasant school work. To promote this status of school work is the privilege and duty of a worthy and tactful school principal. If an attempt be made to conceal such mistakes, it is the duty of the principal to discover and to correct them. The principal, worthy the name and position, is amenable to the same conditions and regulations in his relations to teachers and pupils professionally and officially.

Not only must the principal be a determining factor in the more serious work of the school, but his influence must reach every department and phase of school work and activity. It is to him that the school authorities and the general public look for good results. The principal who is unable to influence and control the policy of his school is incompetent and has exhausted his influence for good in the school and in the community in which he labors. This policy should be, must be, broad, discreet and adequate for the present and future needs of all concerned.

In discussing some of the essential duties of a principal in his relations to the pupils, I have necessarily involved the teacher who is inseparable from any relation pertaining to school work. The assistant teachers are the principal's cabinet and they must agree upon all measures pertaining to the school, both by giving and by receiving advice, and in enforcing the regulations of the school, even when a unanimous consent is not obtainable. It is the duty of teachers to carry on the policy of the school and to allow the responsibility to rest upon those who are responsible for it. As stated before, this responsibility rests largely upon the principal. If this relationship between teachers and principal is the correct one, a detailed discussion of it is unnecessary. I desire, however, to emphasize a few things in this relationship which are important.

It is the duty and the privilege of a principal to be a large man—a manly man. He must command the respect and the confidence of his teachers by his attainments in scholarship, in prudence, in wisdom, in the mastery of persons and of measures involving his school, and in his general usefulness in the community; he must be above deceit and littleness in dealing with people, and be sincere, frank and courteous—a true man, a large man, personally and officially. A principal who quarrels with his teachers and is unable in the right way to influence them and to be influenced by them is not of the right size for his position.

It is unnecessary to unduly emphasize the duty of a principal to know and to supervise the work of his teachers—to correct pedagogical errors and to be exacting and persistent in correct methods of work and of discipline. To do so tactfully and successfully is the mark of a worthy principal. These ends are accomplished by visiting class-rooms, by requiring outlines of work monthly, by free discussions in faculty meetings and by private interviews.

In order that teachers may pursue the policy of the school and carry out certain regulations, they must know definitely what they are. In this respect many principals fail, either because they have no definite plans or because they lack the ability to pursue them. Unfortunate is a worthy teacher under an incompetent and ineffective principal who makes the work of his teachers hard, and who often blames them for failures which he causes, promotes and invites by his solicitous and wavering policy and methods, and which he hopes will save him and his position.

In no feature of school work does the principal feel the delinquency of his teachers quite so much as in mistakes of discipline. Unhappy is the principal who cannot remove mistakes of this kind without harm to the teacher as well as to the pupil. And even more unfortunate is that teacher who is obliged to labor with a

principal who is unsuccessful and tactless in discipline.

It is the duty of a high school principal to prove to his Superintendent and Board of Education that he is worthy of their implicit confidence and support, for without these he can do little and the work of the school will be hampered.

The attitude of principals and teachers to pupils will largely determine their attitude and the attitude of their parents in school affairs. I realize, with you, that the responsibilities imposed upon the schools by the indifference of many parents is a serious problem when the aims of school work are fully appreciated and reasonably attained. Just where, in the educational welfare of pupils, the responsibility of the school ends, and the responsibility of the home begins, is almost indeterminable during the school period. How then can the school interest and influence parents to obtain their co-operation in the welfare of their children?

Unless parents and teachers reasonably understand each other, the tendency of the home to blame the school, and *vice versa*, for the shortcomings and delinquency of our boys and girls, the unsatisfactory conditions will continue and all concerned will suffer by them. By means of weekly or monthly reports of teachers, and by personal observations on the progress of pupils in work and in conduct, the principal secures the information necessary to advise and to encourage pupils to do better. Should the deliquencies of pupils continue after the causes of such delinquency have been revealed to pupils and the mistake corrected as far as the school is concerned directly, it becomes the duty of the principal as well as of the other teachers to inform the parents of the delinquency, either by some fixed method, as stated reports, or by special correspondence. The latter, I am inclined to believe, is the better way. The delinquency has been traced to a lack of home study, to irregular attendance, to attractions and distractions external to the school and under the control of parents who share sometimes thoughtlessly, or otherwise, in the mistakes of their children. By a majority of parents the information which the school possesses and communicates to the home, relative to the progress of their children, will be kindly received and used to coöperate with the school in the correction and control of many unfavorable conditions, and causes for failure in educational work. And when this is not the case, the responsibility of the school becomes even greater. We need to be most concerned about those pupils who need our help most, and unless the school stands for this and much more, it is not the educational force which we profess it to be.

The general public also looks to the school system, and especially to the high school, to produce future citizens, intellectually, morally and socially well-prepared to participate conspicuously in the affairs of society, and to this end the educational work of our schools must lend.

Our educational matter must not be found in text-books alone, but in every problem which concerns or confronts the community. In this connection I speak especially of the high school, which must foster and promote convictions and opinions in its students to prepare them for right living. We must be in the front rank of institutions and measures which protect men and women, boys and girls, who stand for principle and good citizenship. In these respects, the high school principal and teachers must be leaders and promoters.

The high school principal must not only establish and maintain correct standards of work and conduct in his school and be known as an educational leader, professionally and actively up-to-date in school work, but he must stand for all that is best and noblest in the political, social and moral practices of the community in which he labors. There are few institutions or practices in his community to which he is not directly or indirectly related, because of their effect upon his scholars and the homes represented by them. For if the work of the school is to be effective, teachers must labor in school and out of it to promote those political, moral and social standards which will uphold the ideals and work of the school, after its direct influence upon pupils has ceased. Our boys and girls should stand for what the school stands and for what we personally and officially stand. What we teach to be educationally, morally, socially and politically right should be living convictions in the minds and souls of our young people in school, and when they leave it. In order that they may effectively live these convictions, we must help to improve social conditions in general, as well as educate our boys and girls for their fuller realization.

In conclusion, allow me to say that I trust I have been able, in the hurried preparation of this paper, to mention some of the most important duties of a high school principal from his point of view. Until we more fully understand and realize the obligations imposed upon us, and to be assumed by us professionally, officially and personally, we shall not have done what we could.

THE HIGH SCHOOL PRINCIPAL'S DUTIES FROM THE TEACHER'S POINT OF VIEW

was the subject of the next paper by Prof. Frederick Lohstoeter, of Pittsburg, who read as follows:

In undertaking to discuss the duties of the high school principal from a teacher's point of view, I first wish clearly to define my subject. It is not my intention to proceed in a descriptive manner and to enumerate and then discuss the various duties of a principal that may be assigned to him by the regulations of different school organizations. I shall simply try to point out to you those duties which, according to my idea, are the most important obligations inherent in the office of principal. Thus, it may easily happen that my interpretation of this office is not always quite in accordance with the requirements of existing law; or, at least, expects from the principal services which, under the circumstances, he cannot very well render. I deem it advisable, at the outset, to state this expressly so that misunderstandings be avoided, for I am well aware of the fact that school principals are often so overburdened with administrative or even mere clerical work that they cannot help neglecting a number of higher duties which, theoretically, their office implies.

Regarding the principal's position as that of the head of the school, we easily perceive that his activity is necessarily directed first toward those within the school; namely, teachers and scholars; and, secondly, toward those outside the school; namely, parents and the general public. In this division I have purposely left out of consideration the relations of the principal to his superiors; for, important as these relations may be, they are so more from a political than from a pedagogical point of view.

And first let me say that a principal should never give up the practice of teaching. No matter how much experience he has gathered in earlier years, he cannot keep alive this experience in a desirable degree, unless he daily practices the art of teaching; and as it is his function to direct and supervise the work of other teachers, he must be possessed of a living experience. A teacher whose work the principal is called upon to criticize, will be much more ready to listen to his suggestions and to take his advice, if he can feel convinced that the critic is not merely relieving himself of "glittering generalities," but knows from daily experience what he is talking about, and, moreover, practically demonstrates his superior ability and experience through the results of his work. In view of the principal's other duties, it goes without saying that the number of his teaching hours must be moderate; but it must be large enough to keep him in constant touch with the practical problems of teaching.

However, setting an example as a successful teacher is not the only advantage for the sake of which a principal should keep on teaching. We have remarked that it is also his duty to supervise the work of his teaching staff. There is no better way for him to find out what is actually accomplished in his school than by teaching a number of the students himself, especially, as will probably be the rule, if they belong to the older class of pupils. By thus having an excellent chance to observe the working of his students' minds, he could speedily detect any deficiency in their method of study. He would thus be enabled to find out more thoroughly than by any other way whether his teachers are not only imparting knowledge, but are also striving to train the students to think for themselves and are thereby pursuing the final aim of the teacher, namely to make the students more and more independent of him. Neither examinations nor inspections, no matter how frequent, reveal to a person the mental state of students to the same extent as the act of teaching them, for the teaching process offers a far better opportunity to observe the mind in more varied aspects.

No less than the mental condition of the students is the general spirit of the school revealed to the principal by his regular participation in teaching. It is true, he has numerous opportunities for interviews with individual students, numerous opportunities for meeting the school as a whole or single bodies of it; but all these opportunities are more or less special occasions which can never afford such intimate knowledge as is to be gained from the daily contact with the students in the routine of teaching.

And, if need be, it would serve as an excellent inspiration both for teachers and for students, not only for the individual teacher whose work the principal may have had occasion to criticize. It is with a faculty of teachers as in every other condition of life—the exemplary performance of his duties on the part of a superior always serves for his subordinates as a stimulus to emulate him. And it is easy to see what vital influence the spirit of the faculty will always have upon the spirit of the students. Under such circumstances it is, indeed, illogical if the head of the

faculty keeps aloof from performing his share of the great work of the school, from teaching.

The demand that the principal should teach makes it, of course, necessary that he be master of at least one of the subjects taught in a high school. This does not mean merely that he should possess the knowledge needed for teaching it; it also means that he have a clear understanding of the educational value of, and be fully conversant with the different methods of teaching his subject. Even this, however, is not enough in his case. He ought to master the other subjects at least to such an extent as to be able to measure their relative educational values and plainly to see whether the different subjects of a certain curriculum are organically connected with one another. In other words, the principal must be an educator, not a mere teacher in the sense in which that term is so often used—or should I rather say—*misused?*—namely, as meaning nothing but a communicator of knowledge. Every teacher ought to be an educator; but, alas! not every teacher is; and many a one, by constantly teaching a particular subject, becomes, gradually, so deeply impressed with its importance that he loses all sense of proportion. In such cases we have to depend upon the principal for a peaceful adjustment of exaggerated claims. How can he successfully accomplish this, unless he is equipped with the necessary authority based upon an intelligent discrimination between educational values?

This consideration leads us to a point which I regard as very important; namely, the holding of faculty meetings. I am not now thinking of those meetings which, perhaps, are not lacking in any school and which have for their object the arrangement of practical school matters. I have in mind such meetings as are intended for the mutual advancement of the teachers in their professional faculties. I may be mistaken, but I am under the impression that there is lacking in American schools a feeling of fellowship among the teachers. No school can produce the best results unless this feeling prevails. Unity of instruction is out of the question, if the individual teacher does not know or care what is being done with his students in other classes. To bring about this unity, faculty meetings for theoretical discussions are indispensable. It is difficult for the individual to keep abreast of the times. We are living in an age of transition, and I venture to hope that this transition means progress. A new scale of moral values is working out, new ideals are shaping; or perhaps I should come nearer the truth by saying that old ideals are regaining their former ground, that, after an age of unheard-of material progress, idealism is dawning again upon mankind. Until a new stage of development has definitely been reached, all is uncertain; and, unfortunate is the man who, at such a time, does not keep in contact with his fellowmen. What, however, could be more affected by a change in the general ideals of life than education?, which is sometimes defined as a preparation for life or as an adjustment to surrounding conditions. Should, then, the individual teacher, not constantly seek professional intercourse with his fellow-teachers, so that he may both give and receive? For it is this exchange of ideas which stimulates and inspires. And if there be a man who, from time to time, needs a new impulse on his weary path, it is surely the teacher. More perhaps than any other professional man has he to reckon with an unappreciative public. Under such circumstances he is in pressing need of that encouragement which springs from the feeling that there are others in the field, led on by similar ideals. Mere conversations with fellow-teachers would not bring about the same result, as they are only occasional and naturally lack system. But a collective body of teachers under the direction of an enthusiastic and intelligent principal can accomplish quite different results. Each member would have to report, from time to time, on newly-published books and essays dealing with his particular subject. By so informing others he would always keep himself informed in a most desirable manner; on the other hand he would be richly rewarded for his efforts by having his views expanded through the information derived from the reports of his colleagues on their respective subjects. The principal himself, although naturally the leader on such occasions, would profit greatly by having his attention called to many points that, otherwise, might easily escape his notice. Thus, while infusing enthusiasm and interest into his subordinates, he receives, in return, an assistance which might greatly lighten the burden of his official duties. For it is, naturally, one of the foremost duties of a principal never to tire of keeping informed as to the development of educational ideas and ideals, so that he may be able, as far as it is within his power, to introduce or to try at least such innovations as seem to him to deserve a trial. This is especially true with regard to methods, the discussion of which never stops—a rather promising fact; for it clearly proves alertness of mind and

constant watchfulness as to how to arrive at a desired goal in the most economical way. A good method is synonymous with economy, and while economy, if you will pardon me for saying so, is not exactly the chief characteristic of the Americans in any field, it is less so in education, where we can do without it least of all. With bad methods, we may here squander not only money and time, but what is worse, we may not properly develop or may even nip in the bud promising mental gifts.

Therefore, as a supplement to such faculty meetings, the principal must never cease to visit the classes of his teachers, especially those of the younger and inexperienced ones; and he must do this not only occasionally, but regularly and methodically, so that he may gain from direct observation a clear idea of the methods his teachers are using. There is, perhaps, hardly a branch of study for which different methods are not advocated; but it cannot be denied that, through pedagogical experience aided by experimental psychology, certain processes of teaching and learning have proved futile or at least less fruitful than others. If a principal should discover that one of his teachers used such a wrong method, he should at once call his attention to it, and see to it that matters be remedied. But a conscientious principal would not be satisfied merely with seeing his advice followed; he would also try to convince the teacher of the faultiness of his method; because a purely mechanical application of the suggested change might not be very fruitful either. In cases like this such faculty meetings would surely prove very useful, for a general discussion of the question might considerably smooth the thorny path of the principal. Professor Bagaber-Collins, of Teachers' College, Columbia University, says in the preface to his excellent book on the Teaching of German in Secondary Schools: "We are still in the experimental stage of language teaching. The time is not ripe for any man to come and say, and scientifically prove 'my method is the method.' We still lack scientific data with regard to the mental processes involved in learning a foreign language."

Is the same not true with reference to many another branch of learning? And if it be true, should we not all be glad to receive furtherance from any person, but most of all from one another. The faculty of a school should not be only a teaching body for the students, it should make itself also an instrument for teaching itself. Let us not expose ourselves to the reproachful question: "Thou that teachest another, teachest thou not thyself?"

Let there always be capable principals who are willing to cast search lights upon doubtful matters pertaining to teaching. Let them constantly apply the X-rays of pedagogical inquiry, both theoretical and practical, to find out of what material their teachers are made. Let them weed out, as much as is in their power, all elements that mar the unity of purpose in the faculty. Let there be faculties of which it may be said: "Many minds, but one heart."

The importance of this principle becomes quite manifest in the relations of the principal to the students. The latter should always be under the impression that the faculty, headed by the principal, stands for one; that disrespect shown to any individual teacher is at the same time an offense against the faculty, yes, against the whole school, because such lack of discipline often reveals a lack of the proper spirit, for which not only the individual but the whole school is responsible. In the case of differences between a teacher and a student, therefore, the principal should uphold the former as long as possible and should allow even a rather severe punishment to stand instead of aiming at a compromising settlement, unless it be too evidently disproportionate to the offense. This by no means implies that, in a private interview with the teacher, he should not advise him to be a little more cautious in the future, and to remember a saying of Schiller that a bow-string, if under too great a tension, is apt to break. Absolute justice must, of course, be the motto of every principal, and I hope that the rule of conduct which I have just pronounced, will not be understood as seeking an unfair protection for the individual teacher. Not in behalf of the individual am I speaking, but in behalf of authority, which is at present the stepchild in the household of this great nation. Or am I saying too much in claiming that American youth is not overimbued with the spirit of awe and veneration, with that refined feeling which I am inclined to regard as the most essential element of culture? While its cultivation must be begun and kept up in the homes, it must be fostered in the schools also, and a great task is waiting here for the high school principal. Owing to their age, the high school students are apt to be the most unruly ones, and consequently it is hardest to arouse in them the feeling of respect for authority. Authority is not a mere gift of heaven, it must be worked for like anything else in this world; and so the teachers have to work for it too, namely, by efficiency. But the soil on which the young minds in this country grow is not favorable to such work.

I once heard a principal say that it might not be so difficult after all to educate American children if one could first educate the parents. There's the rub! Educate the parents! Who shall reach them? I say: the principal. To him they naturally turn first, whenever they have to make a complaint either about the conduct of a teacher or about the course outlined for their children, or about the work required of the latter, or whatever else it may be. I should think that here is an unlimited field of instruction for the principal, although not a desirable one; and probably the principal will have to console himself with the Latin saying, "Gutta cavat lapidem non semel sed sæpe cadendo." (The drop of water hollows out the stone by falling not once but many times.)

But the education of the parents—if you will allow me to use the term—could certainly be made more fruitful, if an education of the general public should accompany it. We hear a great deal about educational campaigns in a political sense. The greatest of all educational campaigns is yet to be carried on for the sake of education itself. When there exists such a lack of consensus of opinion among the educators themselves, it is not to be wondered at that the general public are sometimes entertaining strange ideas as to the aims and the value of education. So it is the logical duty of the leading representatives of education, among them the high school principals, to enlighten the public on the relations existing between school and life. Instead of compelling the public, as at the commencement exercises, to listen to the more or less artificial essays of immature minds, it would, in my humble opinion, be more practical to have the principal or an experienced teacher to address the public on such subjects as would convey a clear idea of the aims and of the value of the work done in the schools. The treatment ought not to be of too general a character, because that would merely hinder a clear understanding: on the contrary, while it ought to keep on a popular level, it ought to be detailed enough clearly to illuminate the different aims and phases of the educative process.

In conclusion, I will repeat what I said at the beginning, that present conditions may not be favorable to the execution of such duties on the part of the principal. In order to mention only two points without which this ideal state of things cannot be realized, let me say, first, that it can exist only in schools in which the number of students does not exceed a certain limit, so that the direct influence of the principal upon each single member of his school is an actual possibility; and, secondly, that the office of principal must be made permanent during good behavior, that is to say, must be placed beyond the reach of politics.

But even with all the external prerequisites given, the office of high school principal still requires a man of rare qualities both of mind and character and with a more than ordinary capacity for work. The best institutions do not avail much if the men are lacking that are able to make right use of them. This rule applies, perhaps more than to any other relation of life, to education which allows and requires a more immediate influence of mind upon mind and of character upon character. Therefore let me conclude with the wish that this nation may never lack men capable of undertaking the arduous duties of a high school principal, who are willing to perform these duties with that idealism and that spirit of self-denial which alone can produce results corresponding to the growing importance of the High Schools.

There being no time for a general discussion of the subject, the department proceeded to the consideration of the next subject on the programme:

MORAL TRAINING IN THE HIGH SCHOOL.

Rev. J. D. Moffat, D.D., LL.D., President of Washington and Jefferson College, spoke in substance as follows:

I ought at the outset to confess that I do not know much about modern high schools. I never taught in one; and although years ago I attended what was then called a high school, I do not know that the methods then in use would be found in our modern schools. I have had little to do with the public schools since forty years ago, when I twice taught a country school. Although profoundly interested in the work of education, it has been in a different direction. So that in my talk to you I may make blunders, and even suggest impossibilities.

Let me call your attention to the fact that the subject which is now under discussion is moral training, rather than moral instruction. There seems to be a strong prejudice against the latter in our schools. I believe there is ground for this feeling, and confess to sharing it myself. Too often it is only an abstract discussion of principles, which does not interest the pupils. Again, almost all the text-books on moral philosophy are constructed on one plan—about seven-eighths of the space is a discussion of moral principles, such as the nature of conscience, the nature of right, the ground of obligation, the theories of morals from the time of Plato to the time

of Herbert Spencer. At the end of these books is usually found a chapter on duties—practical, familiar topics. This condition ought to be reversed, and seven-eighths of the time be given to the discussion of the practical duties of life. And it is not difficult to interest pupils in such matters as justice and benevolence. Again, even if a text-book be carefully studied, it is knowledge that is given to the pupil, whereas the thing of vital moment—his consent to the principles of self-government—is not generally attained.

But there is no prejudice against moral *training*. No one will object to such a course of training as will lead pupils to stay married when married, be honest in politics, in short to be good citizens.

There is a moral training given by high schools which is quite independent of any discussion of ethical principles. (1) The mere attendance at a school day after day introduces system into life. Certain requirements are to be met with in a school, and the pupil gets accustomed to meeting his engagements. (2) Certain tasks are required to be done which help in the formation of ideals. Knowing that he will be measured by a certain standard, the pupil learns accuracy. In arithmetic he learns that no error is a slight error. In geography and history, also, a standard is set, an ideal is to be reached, and the pupil acquires a sense of completeness, and thereby becomes a better citizen. (3) Industry and (4) obedience to authority are indirectly learned by a pupil—virtues not to be despised. (5) The social virtues are learned by contact with his fellow-pupils. Their development in a greater or less degree is, indeed, inevitable. A measure of honesty, for instance, cannot help but be manifested by a given pupil. Public opinion among her classmates will compel it.

This kind of moral training is independent of specific teaching. It is not enough, however, being rather animal than human training. You can train a dog or a horse to do a given thing well, and when asked to do it. But this mechanical obedience, though something, is not nearly all that we demand of a human being. There is no solid moral character behind it. Such acts cannot be considered moral acts, for the element of choice did not enter into them. A moral act is performed only in obedience to self-enacted law, based on moral principles. If we do give moral training to our young people, let them develop their own moral principles, not commit principles heard from you or me. A moral man is a self-governing man. If we give our pupils no opportunity to form their own moral principles, they are trained performers, not moral agents.

How shall this be accomplished? Methods must necessarily vary. Teachers can, however, give the pupils as many opportunities as possible, to discuss moral problems with a view to forming their own opinions. This plan may be thought dangerous, because wrong opinions may be formed. I am not sure of that. The difficulty will probably be, not that wrong opinions will be formed, but that right ones, once formed, will not be acted on. This plan has the advantage, too, that a good opinion, once formulated, is more likely to be acted on.

Such discussions of moral questions had better be informal, during the ordinary work of the day. Let questions of honor, truth, etc., be discussed as the occasions arise. It would even be well for teachers to create opportunities for the pupils thus to express themselves. Take games, for instance. Moral principles are constantly acted on or violated here. They offer a splendid opportunity for the development of a strong moral character. I have watched football, particularly. I know the virtues and the evils of the game. I have seen men master temptations on the field. I have known coaches who taught immorality; but others who taught self-control, even to the receiving of a blow, without changing color. That is something worth knowing.

I do not know whether ethics is taught in high schools or not. In a normal school library, I recently found a book in which moral questions are discussed in a familiar manner by a professor of Harvard. Every teacher should have such a book, so that he can intelligently preside over such discussions as I have suggested. There should be no committing of principles. I insist upon it that everyone must be a law unto himself. External authority can be evaded, public opinion despised; but the thought of the inner self abides.

I recently rode on a Pittsburg trolley car, on my way from Carnegie Institute. The car being crowded, the conductor overlooked me, and did not take my fare. I asked myself what I should do, and then why I should do it. When I got off the car I gave the man his nickel. He looked surprised, and I cannot say whether he rang up my fare or not. That was his business. To pay him was mine, for one has no right to cheat even a railroad. I did not pay that fare for God's sake, nor from fear of hell, but to be honest. That is a law of mine. People are only moral as they love right. Give the girls and boys a chance to know right and love it.

Look for chances, not to lecture, but to have them express themselves. It may be that some will go wrong, but then their companions will take issue with them.

This kind of training is what we want from high schools. Learning is valuable, but it is only one of the ends to be reached by our schools. I have so much faith in them that I am not afraid when I hear of the thousands of foreigners who are coming to our shores. The church cannot reach them all, but the school can make of them better citizens than they were in the old country. Especially encouraging is it to hear how they are met when they land in New York, and learn not only the English language, but English morality.

Adjourned.

WEDNESDAY MORNING.

THE Department convened, as announced, at 8:30, and proceeded at once to the morning's work. The first paper was that of Prof. A. M. Longenecker, of the Altoona High School, as follows:

WHAT EXPERIMENTS SHOULD CONSTITUTE THE INDIVIDUAL WORK OF A STUDENT IN A YEAR'S COURSE IN PHYSICS?

The amount and scope of individual laboratory work for a pupil in a year's course in physics depends upon several factors. Just within the last few years has it been considered of necessary importance to have individual work in physics, now better known as laboratory physics. The older tendency was to take for granted as true whatever the author said and put in such a manner that a course of book physics seemed a very nice mental gymnastic exercise in committing a series of meaningless laws and facts—all or at least most of which can now be readily worked out by our modern methods of laboratory practice.

The underlying principle in the presentation of physics at the present time thus rests upon a well-directed course to meet several conditions imposed upon the teacher of modern physics. The most important factors that are involved we shall hereby endeavor to discuss—however unsatisfactory a solution for a definite system our efforts may be. The first consideration for a course in laboratory physics is, What shall be the object of such a course? Shall a course in laboratory physics be one for general culture, leading to a knowledge of facts for general information? or shall such a course be along the fundamental preparatory lines, so that the pupil may become prepared to continue work on scientific lines in higher technical schools? Classes in general physics usually have pupils of the above classified types, and hence courses must be adjusted to meet both requirements, yet we deem it altogether satisfactory for all concerned to shape a series of experiments whereby the most practical and useful applications can be made. A course in high school laboratory physics must surely take into consideration that mental development lies at the bottom of such a course, and each pupil following it should feel that the thinking process must be touched and aroused to a healthy growth; otherwise a course in laboratory physics is worse than useless. To see and understand the working of any piece of apparatus, and draw conclusions from the same, surely requires as much mental activity, alertness of observation and general mental excitation as any problem in geometry; and thus we would in the first place emphasize the mental process in all the selected experiments. In the next place, since so much practical knowledge is now called for in courses of education, it is almost necessary to meet this well-nigh unreasonable request to obtain the practical side for all experimental work. By the practical side we mean that all experiments should endeavor to solve some practical problem. But this practical side needs so much auxiliary aid that we must go beyond the practical scope to point out the fundamental basis on which all scientific investigation rests for a footing to higher pinnacles.

The number and even the kind of individual laboratory experiments largely depend upon the amount of time allotted by the schedule of the school programme. To simply state that a certain number of experiments is to be performed by each pupil is in fact a meaningless statement. Grant that thirty-five experiments are performed, data taken, written out, etc., it is absolutely nothing, since an experiment can be made very short; and hence thirty-five experiments may mean thirty-five hours' work, or they may represent one hundred and forty hours' work, all depending upon the variety of changes assumed to prove the same fact or series of facts. Where physics is placed in the third or fourth year of high school work, and limited to one year, as is usually the case in most high schools, we should consider the following amount of time as sufficient to give the pupil a good understanding of a general survey and an introduction to what is known as the elementary phases of Mechanics, Heat, Sound, Light and Electricity. The amount of classroom work, including the text-book with

arithmetical operations and lecture demonstrations, should include at least 180 periods, or one recitation daily, whereas the individual pupil should then have at least one half of above allotted time in addition, or 90 periods, for individual work.

In this period of time at least thirty-five experiments may be worked out very satisfactorily by every pupil. But thirty-five experiments are, of course, a minimum in laboratory practice, as they will allow only a limited few of the many experiments now possible to be performed. In fact, seventy-five experiments are closer to a true working knowledge of elementary physics. However, the teacher of physics must remember that the pupil following a course of elementary physics has other studies to prepare, and hence not all his time must be taken for this course. The amount of available time is, however, a great factor in determining the number and kind of experiments to be performed by the pupil. Should a programme of a high school be so arranged as not to consider at all the teacher of physics, it were far better to lock the laboratory and keep it only as an ornament of the school.

Experiments as usually given may be classified as Qualitative and Quantitative, each of which has its proper place in a course of physics. The former are usually employed for lecture-table work, where not so much data need be taken to demonstrate truths, as to point out the nature and mere facts of the problem under consideration. The Quantitative relations—where the "how much" is a necessary adjunct, is the kind of experiment which should be almost wholly used in the pupil's individual work. Quantitative work, however, should be employed principally where the third or fourth year of a high school course is given the place for physics. If a first year of the high school course is given to physics, then only a limited amount of quantitative work should be required, and somewhat more in a second year. A few qualitative experiments may even be placed in a third or fourth year. One well-directed quantitative experiment, however, is usually worth three or four qualitative ones, as it involves more mental steps and also a closer observation and more tedious line of arrangement and variation to prove a law or establish facts under consideration.

A course of laboratory physics in a high school to cover one year's work must also take into consideration that all pupils coming up for this kind of work have had very little or no training whatever in any line of scientific investigation, and hence, to meet this emergency, the course arranged must not be too complicated—even trimming and pruning somewhat the so-called college requirements in some cases; for we actually believe that our college friends try to impose a little upon the ability of the high school pupils, since often we find experiments included in entrance requirements involving mathematical relations not included in the courses of mathematics given in a high school. Then again the kind of apparatus available and within financial reach of the city or community where such a course is presented, must also receive due consideration. Yet to advocate the theory that most of the apparatus necessary to give a good course in laboratory physics may be constructed, is like telling a man to construct a fine building without good tools. Any good workman who turns out good work in a short time requires good tools; likewise a pupil who is expected to turn out good results needs good apparatus. A good work bench is an almost necessary adjunct to a physical laboratory; but only to construct accessories and not fundamental pieces of apparatus. We are not of opinion that the physical laboratory is a place for manufacturing articles. That belongs to our manual training shops. If the laboratory becomes a construction shop then physics is usually neglected and stress laid upon the manual training side alone. However we do not pretend to advocate the necessity of the finest and most costly apparatus—as the complexity of some pieces of apparatus involves too much insight to appeal to the average pupil; but apparatus promiscuously bought and placed in laboratories in a haphazard way often hinders its efficiency. Yet such is usually the condition of affairs in the average high school laboratory where the frequent change of teachers does not allow of the fitting up of a good working laboratory; for one teacher selects and directs a course in one way, another may select along some other line; and as long as State supervision does not direct the courses of study just so long will there be no fixed standard for pupils to reach, and no way for the teacher to prepare himself for the varying demands of different schools.

What experiments should constitute the individual work of a student in a year's course in physics is therefore a somewhat difficult question to answer, since it depends so much upon the object of the course, time allowed, laboratory facilities, and the year in which the course is pursued; and to designate how many experiments would be utter folly indeed. However, as already intimated, the greater portion of the experiments should involve quantitative relations

implying thereby that a series of qualitative experiments is pursued in a parallel course usually known as lecture or deomnstration experiments, given by the teacher from the lecture table. In each experiment thus presented for consideration by the student a notebook must be kept wherein are recorded the name of the experiment, its object, procedure, drawing or cross-section of apparatus, data procured direct from observation, with mathematical calculations, inferences and deductions drawn, errors considered, and curves on the coördinate system constructed for further calculations wherever possible. The graph system of representing data has of late years risen to so much importance in all sciences that we deem it of more than ordinary importance to say at least a few words about it, inasmuch as this method shows to the eye the relations between two quantities which are so connected that any change in the value of one is attended by a change in the other; as, for instance, the height to which water rises in a capillary tube is greater, as the diameter of the tube is less. For example, in using tubes of ¼, ½, ¾, 1, 1¼ and 1½ millimeter bore, six observations are sufficient to procure a curve on the coördinate system whereby any bore and height of rise may be calculated.

As a necessary introduction to all laboratory work the student must of course become acquainted with a few measuring instruments, and to do so a few experiments should be performed by him in making simple measurements. We often find students totally unacquainted with the metric system, and hence the first experiments ought to be along the lines of simple measurements. Amongst these we may name the following six experiments that we deem necessary. None are complicated, but they are selected for simple illustration and acquaintance with measuring devices. These experiments, to cover the elementary phases of a first year's course in physics and to be performed by pupils of the third and fourth years of a high school course are as follows:

1. The use of a meter stick. Measuring the distance between two points on a table or measuring the table itself. Here the pupil ought to do very accurate measuring, even trying to read to tenths of a millimeter. Also measure in the English system and get the relation between an inch and a centimeter.

2. To measure the length of a straight line drawn on the page of a note book. To measure with a pair of dividers on a diagonal scale. This experiment teaches a more accurate method than number one above, and does not depend upon a mere guess.

3. To find the gauge number and diameter of wire by means of a wire micrometer and a wire gauge. This experiment is of great importance and much practice should be given, since it is of so much importance in electrical wires, and teaching in Electricity.

4. To find the inside and outside diameter of some tube and to find the volume of metal in tube by the aid of a vernier steel caliper.

5. To teach the use of a protractor in measuring the angles of a triangle drawn on the note book and also to find the area of same triangle.

6. To find the mass of a body. (*a*) By double weighing—that is, weigh body on one side of a beam balance and then on the other side. (*b*) By means of an analytical beam balance, if there is one in the laboratory—and no laboratory should be without at least a moderately good analytical beam balance.

With the foregoing six simple problems in measurements we deem the pupil sufficiently prepared to enter the Mechanics of Solids, where at least twelve experiments should be performed to understand the subject from an introductory standpoint. A good set of experiments is as follows:

1. To measure the tenacity of a wire by means of a draw-scale or a specially-made contrivance to prevent a recoil of the spring when the wire breaks.

2. To calibrate a spiral spring, or, better, calibrate a Jolly balance and find its modulus.

3. To verify the laws of elasticity of bending as exhibted by uniform bars or rods. In this experiment a vernier micrometer and electrical contact must be employed to procure good results.

4. To verify the laws of elasticity of torsion as exhibited by uniform rods or bars.

5. To verify the rule for compounding concurrent forces acting at an angle, and also for compounding parallel forces acting in the same direction.

6. To verify the laws of accelerated motion by means of a ball rolling down an inclined plane, or by a weighted pulley down a wire stretched rigidly at ends with a turnbuckle.

7. The pendulum: Laws of, and to find the value of gravity.

8. To verify the laws of equilibrium of the three classes of levers.

9. Laws for the pulley, one fixed, several movable, block and tackle.

10. To prove law for wheel and axle.

11. Law for inclined plane.

12. To measure the coefficient of friction between two sliding surfaces.

The foregoing experiments in the mechanics of solids are all included in entrance requirements. Many more could be added, but only such were selected as are used in class-work and can readily be performed. Each experiment, too, can be adapted to prevailing conditions. Much or little time can be devoted to each, and they can be performed in a laboratory containing only the simplest apparatus. That for the laws of torsion requires a good piece of apparatus to give good results.

In a study of the Mechanics of Fluids the most simple, yet fundamental, experiments are the following eight:

1. To verify the laws of capillary action by means of five or six capillary tubes, each of different bore, using different liquids at different temperatures.

2. Archimedes' principle: To show that the buoyant force of a liquid on a submerged body is equal to the weight of the liquid displaced by the bodv.

3. To find the density of a body heavier than water: (*a*) When the body will not dissolve in water; (*b*) when it will dissolve in water, but not in a liquid whose density is known.

4. To find the density of a body lighter than water.

5. To find the density of a liquid: (*a*) By density bottle method; (*b*) by Hare's method; (*c*) by glass sinker method.

6. To verify the laws of liquid pressure.

7. Boyle's law.

8. The law for the siphon: To prove that the rate of flow of a liquid through a siphon is proportional to the square root of the difference of lengths of the arms.

In the consideration of Light the most essential experiments may be included in the following list:

1. Images through small apertures: To ascertain how images are formed through small apertures and what conditions govern their size, brightness and definition. This experiment is especially useful as an introduction to modern photography.

2. To measure the candle power of at least three incandescent lamps and compare with a standard candle, or, better, with a standard incandescent lamp.

3. To verify the law of reflection of light by a simple plane mirror and pin method.

4. To measure the angles of a triangular glass prism, either by the spectrometer or straight-edge method.

5. To measure the focal distance of a concave spherical mirror.

6. To determine the index of refraction of glass by means of pin method, or, better, by the optical disk, and, if possible, by the trigonometric relations of natural sines.

7. To measure the focal distance of a convex lens and to study the nature of images formed by a convex lens.

8. To show the continuous and discontinuous spectra by means of a spectroscope or spectrometer and map the most important lines relative to a certain standard line like the yellow of sodium light.

9. Displacement in a ray of light produced by a plate of glass with parallel edges.

The salient features to develop the fundamental points in heat may be considered in the following:

1. To correct the readings of a thermometer for errors due to the incorrect placing of the freezing point and the boiling point and to construct a graph whereby all readings in the study of heat may at a glance be read correctly.

2. To find the coefficient of linear expansion of several metallic rods, as iron, brass and copper.

2. To find the coefficient of cubical expansion of a liquid by means of a density bottle or by glass tubes, making the usual allowance for the theoretical expansion of glass.

4. To determine the melting point of such substances as paraffine, beeswax and tallow by placing these substances in drawn-out capillary tubes.

5. To determine the boiling points of such liquids as alcohol, glycerine or turpentine by placing same in test tubes immersed in hot linseed oil.

6. To determine the dew point.

7. To determine the specific heat of a solid.

8. To determine the specific heat of a liquid.

9. To determine the heat of fusion of water.

10. To determine the heat of vaporization of water.

In Magnetism the following experiments should be performed to get the simple fundamental ideas of the subject:

1. To find the position of the poles of a bar magnet.

2. To measure the relative magnetic transparency of thin sheets of various substances with the aid of a simple magnetoscope.

3. To compare the strength of the poles of a bar magnet.

4. To find that the magnetic effect due to the earth upon a vibrating magnet varies in different parts of the laboratory.

5. To map the lines of force in the various combinations of magnets by drawing

the lines of force or, better, to make blue prints of the various fields.

In Static Electricity two experiments should form the individual work of a student; viz.:

1. To determine the kind of electrification of a charged body by means of the inductive effect upon a charged electroscope.

2. A study of condensers, arranged in series and parallel, either plate or Leyden jars charged from a static machine.

The manifold experiments possible in current electricity afford usually more than ordinary interest to a beginner in this subject, yet the very variety usually presents more or less difficulty to the teacher in covering the subject satisfactorily. We have, after careful consideration and trial for work in laboratories, used the following with good results:

1. The effect of a current upon a mounted magnetic needle, first by simple form and then by the use of fifteen coils on a tangent galvanometer, showing the results of current through one to fifteen coils in succession with both direct and reversed current.

2. To construct an electromotive series out of several pairs of different metals immersed in several liquids (chemicals).

3. The study of connecting cells in series, parallel, parallel series and series parallel, and ascertaining the most efficient amperage in each case when external resistance is small or great.

4. Resistance by substitution by means of a tangent galvanometer or a shunted D'Arsonval galvanometer.

5. Resistance by Wheatstone Bridge method, using a fairly sensitive galvanometer across the bridge. Resistance in series and parallel should both be employed here, and law for parallel or shunt be firmly impressed upon the mind of the experimenter.

6. Resistance by the potentiometer method by the use of voltmeter and ammeter alone.

7. To calibrate a tangent galvanometer or to find the constant of a D'Arsonval galvanometer.

8. To show the working of a simple telegraph without and with a relay.

9. To measure the internal resistance of a battery either by the unsatisfactory method of the Wheatstone Bridge or, better, by the half deflection method.

10. A study of a simple dynamo and motor.

In the foregoing we have endeavored to present a series of experiments not selected from a mere theoretical standpoint, but all carefully tried in the laboratory for several years. Even more are sometimes included in a year's course. Several of the more tedious were purposely omitted here. We believe, however, that the foregoing will be a good year's work for the untrained high school pupils. No special devices for performing these experiments are even hinted at. Devices and methods must be left to the discretion of the teacher and never to the haphazard methods of the pupil. Whilst too much help may be offered to the pupil in carrying out a series of observations and in the setting up of apparatus, it is also just as detrimental and discouraging for a pupil to be left to his or her own resources to grope in utter darkness; and hence a well-directed manual or type-written notes will often add a great incentive for a pupil to work along lines where at least signboards lead to the proper goal for a thorough comprehension of any experiment under consideration.

In this vague outline of experiments the consideration of Sound is wholly omitted for the reason that in one year's course in Physics either parts must be omitted or else all portions must suffer for a lack of time. To obviate this difficulty we deemed it proper to omit the entire subject of Sound, which, if the teacher sees fit, may be taught by experiments given by the instructor from the lecture table. Every experiment in the outline involves quantitative relations except one or two; and thus each one requires a series of data to be procured by observation; and nearly all require calculations on the part of the student which will result in increased interest and healthy growth.

Professor Breidinger thought there were too many experiments suggested, for the time generally given to physics.

Professor Stark thought the outline just read would serve as a good standard course for the high schools of the State. All high schools, of course, could not perform all of them. In large cities the entire list might be completed, but smaller schools might content themselves with thirty-five—enough for college entrance. This work had better be done in the last year of the course. Of course it depends on what is called an "experiment," how many can be performed. A good plan would be to select about thirty-five and do good work with them; about twelve in mechanics, three with heat, three with light, six to eight with electricity, and six in measurements.

Professor Breidinger: The difficulty is that physics must be taught before the fourth year of the course, or many pupils do not get benefit from the study. They

leave before it is reached. Physics should not be taught only for those pupils who mean to enter college, for but a small proportion go there.

Professor Reed: When Professor Stark speaks of a "period" for physics, how long a time does he mean?

Professor Stark: The paper mentions forty-five minutes.

Professor Reed: Would it not be better to confine the study of physics to a part of the term—say four or five months—and devote a longer time to it each day? This would give a better opportunity to finish experiments which take a considerable time.

Professor Stark: The general school programme would probably determine the matter. It will be found, too, that the more familiar the teacher becomes with his work, the less time it will take to perform it.

THE AIM AND SCOPE OF THE COURSE IN MATHEMATICS IN THE HIGH SCHOOL

was the title of the next paper, which was read by Prof. F. G. Masters, Connellsville, Pa.

For many years there has been a gradually increasing interest taken in the study of general pedagogy. Time was when an individual, who had a smattering of the common branches, was considered competent to teach school; and his success was measured more by his ability to discipline well than by any other standard. That time has gone by. To-day the man who would achieve success in any walk of life must be trained in his line. It is not sufficient that the physician spend a year or two in the office of a practitioner, and casually *read* medicine; it is necessary for him to have a sound preliminary education before he begins the study of medicine, and then spend not less than four years in the scientific study of the subject under competent instructors. Great advances have been made in the medical profession, and hardly less have been the forward strides in teaching. No man would be considered competent to allay physical pain who simply relied on the recollection of how the family physician treated him in his own illness. In like manner no teacher can do the proper work who relies simply on his recollection of how he was taught. No one who has not made a scientific study of teaching, in a greater or less degree, should be entrusted with the teaching of young minds, which it is as likely he will mar as cultivate.

From the fall of the Roman Empire down to the nineteenth century comparatively little was said or thought about study for discipline. Men's interest was centered on the merit or absurdity of the studies from a literary point of view, on their intrinsic value as matters of knowledge, or on their effect on accepted religious views. The change that has taken place during the nineteenth century is significant. It marks, as has been said, "a revulsion from the bold utilitarianism of the middle and later ages, to the true Christian ideal, which looks upon infinite worth as more important than any of the temporary or earthly uses of his activities, and hence regards his development to the full perfection of his nature as the chief purpose of education." The aim during the later part of this century has been to attempt the practical, while conforming the culture and to the laws of the growing mind.

The subject which we have for consideration is very broad and involves a question which it is eminently proper to ask. Every earnest teacher of Mathematics should ask himself this question many times during the course of the year's work. We as teachers of mathematics cannot feel that we are absolved from answering it, because mathematics holds and has held a proud and honored place for so many centuries in the school curriculum. That fact is the more reason why we ought to give a clear and definite statement of the object sought in its teaching. Good teaching demands that the teacher know what to teach, how to teach, and why he teaches. The good teacher must first know why he teaches a subject, before he can tell just what and how to teach it. The answer to this question must be approached, however, in a broad spirit. We must not force an unreasonable amount of mathematics into the high school course; only so much as will be necessary to accomplish a conservative aim. The high school is not the place for the training of specialists. A broad general culture and training for the duties of life constitute the aim of the high school curriculum as a whole, and mathematics must not usurp more than its share of attention.

President N. M. Butler in the *Educational Review* of November, 1901, gives as evidences of education in part:

1. Correctness and precision in the use of the mother tongue.

2. The power and habit of reflection by which the mind is taught to answer questions, as How and Why, through Science and Philosophy.

3. The power of growth.

4. The power to do.

In what way is mathematics fitted to bear a part in bringing about these evidences? What can mathematics alone contribute? What can be developed better by mathematics than by other subjects? In answering these questions we tell the aim of mathematics.

In setting forth the aim of our course in mathematics, we can readily see that it divides itself into two parts: First, the aim, so far as the practical value is concerned; and, second, so far as it is a type of a certain mode of thought. There is only one department in the school curriculum which is generally conceded to be the most important, and that is the department which teaches the mother-tongue—in our case English and Literature. A proper understanding of English is absolutely essential to good work in any other department. We believe that next in order of importance comes Mathematics. This is an age of scientific investigation and material construction; vast enterprises are undertaken on all sides; hundreds and thousands of men are engaged in a single construction, the success of which is guaranteed even before the first pick is struck into the ground. Electricity and steam are revolutionizing our manner of living, and annihilating space and opposing forces. The architect and the engineer know that, if their plans and calculations are carried out to the letter, there is no possibility of failure. How do they know it? They know it because all of their plans and calculations are made by the use of mathematics, which is infallible. If mathematics were eliminated from our present civilization our whole material structure would fall into ruins; the great ships would cease to plow their way across the ocean, and men would have to wait for a favorable wind to blow them to and fro; great mining and tunnelling enterprises would have to be discontinued because of the absence of the safety guaranteed by mathematics, and the machinery to operate them. The facts of mathematics, being of such vast importance in the material world, should be firmly fixed in the minds of cultured and useful men. Every educated individual should know something of the facts of that subject which guarantees material progress, and promotes in no small degree his own personal comfort.

It might be objected that it is unnecessary to know so many of the facts, and that much of the time should be devoted to other subjects. Of course it is true that the value of mathematics to the great mass of people is indirect, and the average citizen has need of nothing but the merest elements of mathematics. The value of any subject taught in our schools is largely indirect. The elements, and only the elements, of English are in constant use. There is, however, more use for the facts of mathematics in everyday life than for those of ary other subject. There are times when it may be necessary to solve an equation in real business, but when would one be called on to scan Latin verse or describe the fertilization of a flower? Let it, therefore, be our aim to give the high school boy a good sound body of mathematical facts before we start him out in life.

No one can see the end from the beginning. Men are constantly starting out to do one thing and end their careers doing something else. One boy starts to school with the aim of being a preacher and ultimately becomes an ornament to the bar. Another boy intends to become a lawyer and becomes a famous engineer. Very few high school boys know what they are going to make their life-work. How does one know he is going to like a new dish before he has tasted it? How can one say he is going to do this, and not do that, before he knows something of both? One of the chief aims of the high school is to give the pupil an insight into the elements of many departments, so that he may wisely choose one in which he may be a success. There are a large number of growing occupations which require a knowledge of mathematics. The boy may select one of these, and it is the aim of our course to give that boy a foundation, so that he may profitably pursue his chosen work.

A subject whose processes and results are so deeply ingrained in the human mind of all ages and degrees of civilization as mathematics, cannot be slighted in our secondary course of study, since its informational value is so great. In all ages, so far as the same ground has been covered, results have been practically identical. One nation has not found 9×10 to be one thing, and another nation something else. The Hindus solved many mathematical problems which Europeans, many centuries later, independently solved and got the same results. A body of results and processes which have been so characteristic of the human mind, uninfluenced by time or environment, should be known by every well-informed mind. It should be one of our aims to give mathematics an informational value.

Another object which we should have in view is to get our pupils to see the close connection between mathematics and nature. Geometry, as its name signifies, re-

lates to earth measurement. In fact, there is very little in the secondary mathematics which could not have come into existence as a direct or indirect result of the formulation of the relations which are found in nature. Safford says on this subject in his "Mathematical Teaching": "The modern, and to my mind the true, theory is that mathematics is the abstract form of the natural sciences; and that it is valuable as a training of the reasoning powers, not because it is abstract, but because it is a representation of actual things." Nature is so mathematical that some of the more exact natural sciences as Physics and Astronomy, are largely mathematical in their theory. Other sciences which have been chiefly descriptive are becoming more mathematical as they are gradually being developed. As we penetrate deeper and deeper into science, we must develop simultaneously a knowledge of mathematics. It is at least our duty to give the pupil a glimpse of this close relation. Frœbel says on this point: "Mathematics stands forth as that which unites, mediates between Man and Nature, inner and outer world, thought and perception, as no other subject does." Nothing is more interesting to the growing boy than nature; and if we can get him to see the relation which we mention, we can, in most cases, hold his interest in mathematics. Have you ever noticed how quickly the boy's listlessness is changed into interest when you say: "Now I will show you how you can use this principle in every-day life"? How ready he then is to ask questions, or doubt your application of the principle to something practical!

However important it may be to teach mathematics because of its practical and informational value, that is not the chief reason for its study by all pupils. There is something still more important than the practical value; it is the disciplinary, the cultural. The subject matter of mathematics exemplifies most clearly certain modes of thought which every educated man should possess. The ability to grasp the situation, to see clearly the state of affairs, is necessary for every successful man. The facts in every case are not set forth clearly. It *is* true, however, that in most cases, facts are distorted and misleading, and it requires a skilled mind to classify them and arrive at the truth of the matter. Mathematics, more than any other subject, develops this ability. Much practice is necessary to even ordinary success in grasping situations. The physician is called to see a patient, and before he can give the least assistance, he must get at the truth of things, even when the patient is unable to understand and describe the symptoms. It is necessary; his success as a physician depends upon his ability in diagnosis. If he does not know the nature of the indisposition he cannot relieve it. If the physician, in common with all men, must have this mode of thought developed in a high degree, where must he begin? He must begin with situations where the conditions are simple, and then gradually proceed to the more difficult ones. Mathematics furnishes the finest gradations of situations to be grasped. In mathematics we find the most simple, and probably also the most difficult relationships. Mathematics, however, can only furnish the beginning of the training for grappling with the facts of the world. The beginning should be made in the high school; there the pupil should become acquainted with the mode of thought which is so useful in all occupations.

Not the least of our aims should be to have the pupil appreciate clearly and quickly what is given; that is, the situation. Too much stress cannot be put on this aim. Much of the lack of success that pupils experience in their work in mathematics is due to the fact that they are not well trained in distinguishing clearly what the given conditions are. It is not an easy task to develop this ability. How often our pupils plunge in to do *something* not having the least conception of that upon which they must build. Many problems in algebra and propositions in geometry should be discussed from this standpoint alone. Another valuable exercise is to have pupils construct original problems. When a pupil constructs his own problem, and then fails to get a reasonable answer, he will see more clearly where he was wrong in his construction, when the teacher points out the error.

When the facts are well in hand, and the situation is grasped, conclusions must be drawn. Every man is called upon daily to draw conclusions. The acts may vary greatly in this complexity with different individuals and occupations; but all successful men must draw accurate conclusions habitually. A training to a mode of thought that is so important and general must be given in the public high school. What subject will give such training? Mathematics in a greater degree than any other subject. Mathematics does this because the conclusions therein drawn are *certain*. A subject will successfully train in this respect just in that measure in which its conclusions are certain. The

pupil must begin with those conclusions which he knows are absolutely correct. Mathematics furnishes the *best graded* sequence in its conclusions. The pupil may begin with the most simple ones, and, as he acquires more power, pass on to the most difficult ones. This type of thought is found not alone in mathematics, but also in other studies and in every-day life.

Pupils should be taught to appreciate the certainty of mathematics, and thereby the feeling of independence may be gained in greater measure than in any other department of knowledge. In practically all other branches there is a continual conflict of opinions; there are authorities who must be consulted. In mathematics there is general agreement. There may be different schools, but they all work together harmoniously and are supplementary to each other. The high school boy can be just as certain of the accuracy of his work as the most distinguished mathematician. In mathematics the boy can find his own errors or another can point them out to him and he will readily see them. This is not so true in other subjects. In mathematics we need not take the word of another for a single thing. We can demand that we be shown proof, and it is forthcoming. Truly a subject which is so *certain* in its conclusions as mathematics, should be interesting to the high school boy when once his attention is called to this fact. Emerson in his lecture on "Education" says: "Give a boy accurate perceptions. Teach him the difference between the similar and the same. Make him call things by their right names. Pardon him no blunder, Then he will give you solid satisfaction as long as he lives. It is better to teach the child *arithmetic* and *Latin* grammar than rhetoric and moral philosophy, because they require exactitude of performance; it is made certain that the lesson is mastered, and that power of performance is worth more than knowledge. He can learn anything that is important to him now that the power to learn is secured; as mechanics say, when one has learned the use of tools, it is easy to work at a new craft."

The objection may be raised that we cannot carry the methods of mathematics into non-mathematical things. Men will say, "You cannot expect mathematical certainty outside of mathematics. There are too many probabilities, and the facts are obscure in every-day life while in mathematics they are clear." It does not follow that because a man is trained in mathematics he will apply exact mathematical processes in each and every case that arises. He will not give greater weight to the premises than their certainty warrants. The person trained in mathematics will count probabilities as mere probabilities, and will not give them nearly so much weight as the one not so trained.

It is often claimed by teachers and parents that certain children have "no head for mathematics." What shall be our stand on this subject? The general opinion among teachers who have been in the work for many years is, that, so far as primary and secondary mathematics is concerned, there is no truth in this saying. They say that any normal mind can grasp the simple reasoning of secondary mathematics, if it is properly presented. It is hard to understand how one could really lack the power to grasp the reasoning in mathematics, and be a success in a vocation where much more difficult reasonong is necessary. If a boy cannot understand the propositions in geometry, how can he ever hope to become a successful lawyer and analyze a hard case in law? How can one be a student of history and determine the influence of Alexander the Great, if he cannot understand the effect of multiplying both sides of an equation by the same quantity? How can a physician eliminate a disease from the human system, if he could never understand the elimination of x from a system of equations? I believe that any normal boy can learn high school mathematics. Of course some pupils will grasp the idea long before others; all minds are not of equal strength. I believe that the reason so many pupils do so poorly in the high school mathematics, is that they have been given too rapid and difficult work in the grades. If the rate of progress were determined by a thorough comprehension of each process before another is taken up, all of our pupils would be good in mathematics. We cannot, however, wait until every pupil understands each case before taking up another, for if we did, we would do an injustice to the majority of the class, who readily grasp the idea. The pupil can make the best progress only when he himself actually draws the conclusions. Simply assenting to the correctness of a conclusion drawn by some one else, will be of very little value to the student.

We have now considered at some length the two great aims in the teaching of secondary mathematics, namely its practical application and the training to a certain mode of thought with their subdivisions. These are the chief functions in high school mathematics. There are other functions, however, which we shall consider at

less length. A very important aim is the development of the power of generalizing conceptions and combining results. So many of our modern enterprises are held together and kept moving harmoniously only because of the perfect system and classification, that it is incumbent upon us teachers, to train the minds of our pupils to a well-ordered system. It is an excellent plan to have pupils make synopses, and schemes of results relative to some subject. Such work will do much towards training them to classify and generalize.

Men of affairs at the present time do very little work with the actual things of their business. The man who really handles the boxes and lays the rails has a very small part in the management of the great corporation for which he works. It is the man who sits in the little office and has a complete mastery of the symbols of the business who does the directing and receives the largest salary. Only the least remunerative and less desirable occupations work with the actual things. The training in the use of symbolical language which mathematics gives is truly valuable in business; and it furnishes an excellent preparation for other sciences which are largely symbolical.

There is no subject in the school course in which the student can make independent discoveries at an earlier stage than in mathematics. When once the pupil has experienced the delight of independent mental activity he can appreciate the *ideal* of all effort. He will then be likely to exert his mental powers for the mere pleasure of doing it and seeing the result. We should aid the pupil in making independent discoveries as early in his course as possible.

The course in mathematics should cultivate a reverence for truth, because mathematics demands truth and is uninfluenced by any other consideration. Simon in his "Mathematisches Unterrecht" says: "As pure truth is the polar star of our science, so it is the great advantage of our science over others that it awakens more easily the love of truth in our pupils. Languages also have their necessary formulæ, but they do not come to conscious recognition by the pupil who must learn a dozen exceptions to every rule." We can only cultivate a reverence for truth, however, in our pupils, when we deal truthfully with them. The teacher must not try to make the imperfect pass as perfect. A good, earnest teacher will not lose the respect of his pupils if he says he does not see a thing clearly just at that time. Never make it necessary for your pupils to drive you into a corner to make you acknowledge you do not see a thing clearly.

The habit of self-scrutiny can be developed more readily in mathematics than in any other department. In mathematics we should train the pupil to a thorough self-scrutiny and personal responsibility for the correctness of his work. We should not tolerate even the slightest mistake.

Mathematics develops the power of attention better than any other subject in the curriculum. It is necessary only to mention this fact. The slightest inattention in mathematics is fatal. Good teachers of mathematics should do more toward cultivating habits of attention than any other members of the teaching force.

II. The Bureau of Education at Washington accepts the threefold division of instruction into Primary, Secondary and Superior. The Primary division is that which the State provides and expects all of its children to pursue, for its own safety and perpetuity; the Superior is that which is undertaken in our colleges and universities; the Secondary is that which lies between the Primary and the Superior. This description is not, however, entirely true. We cannot draw any definite line between the different divisions. The pupil's development is gradual; the different stages of mental development cannot be marked out clearly and definitely, since certain subjects which are usually classed as belonging to one division, can be taught in the other with great profit. For instance, Algebra and Latin are classed as high school studies, yet there is no reason why those subjects in company with some others which we shall mention, could not be taught very satisfactorily in the grammar grades. Proper gradation in any line of school work requires that a beginning in the more advanced should be made before the end of the more elementary is reached. It is necessary for us to do away with the artificial separation of the grammar grade and the high school in order to accomplish the best results. Many of the western states are recognizing this fact, and are getting very fine results through the closer union of the state universities and the public high schools.

For many years Arithmetic, Geography and English Grammar have been looked upon as the solid studies for the later work in the grades. The attempt has all along been made to teach the pupil all of these subjects that he will ever know. The higher portions of arithmetic and the more technical grammar are beyond the ability of the average pupil to master at the age when they are usually given these subjects.

How much better it would be for the boy or girl, if he were permitted to ease up on Arithmetic, Political Geography and Grammar in about the seventh year of a nine-year grade course, and in their places study a foreign language, algebra, geometry, elementary science and manual training! This is quite revolutionary, we admit, but it is in agreement with such eminent educators as President Butler, Dr. P. H. Hanus, Dr. Hart, Dr. Young of Chicago, Herbert Spencer and many others. This change has been introduced into the grammar schools of Cambridge, Mass., and is giving very satisfactory results, for an account of which I refer you to Dr. Hart's "Studies in Education." Such a substitution of subjects has also been endorsed by more than two hundred teachers, principals and superintendents in replies to Mr. Geo. D. Pettie, of Cleveland, chairman of a committee on an extended high school curriculum. That report represents a contemporary tendency. It favors the extension of the high school course to six years, making two of the grade years the first two high school years in which a beginning of high school studies in an elementary form is begun. This is a statement of the modern tendency in the correlation of the grammar grades and the high school.

Our high school course at present comprises four years, and our pupils range in age from 14 to 18 years. What ought our pupils to know of mathematics when they enter the high school? The Committee of Ten in its report to the N. E. A. says that a pupil entering high school should know those portions of arithmetic which afford a really valuable mental discipline. It also suggests that the following subjects be curtailed or entirely omitted: compound proportion, cube root, abstract mensuration, obsolete denominate quantities, and the greater part of commercial arithmetic. Only the most simple problems in profit and loss, bank discount and simple interest should be solved. The metric system should be taught objectively. The second recommendation of the committee is "that a course of instruction in concrete geometry, with numerous exercises, be introduced into the grammar school. The object of this course is to familiarize the student with the facts of plane and solid geometry, and the conceptions to be later employed in abstract reasoning." The committee further recommends that, "It is desirable during the study of arithmetic to familiarize the pupil with the use of literal expressions and of algebraic language in general. The equation should be introduced in proportion, in problems in analysis, and in percentage.

We have considered the aim of mathematical teaching under two headings, the practical and the cultural. The question then might be, How much mathematics should be given in the high school course in order that we may accomplish our aim? The practical aim is soon accomplished; but not so the cultural. That mathematics may be of any considerable value from the standpoint of culture its study must be pursued for several years, and cover a variety of subjects. The study of mathematics should cease only when its aim has been accomplished. When a student can master the tasks of this subject readily, it is an evidence that those powers, which it is the aim of mathematics to develop, are developed, and there is not much need for further study along that line. At that time other studies in which the pupil is weak, should be given special attention; for, as has been stated, the high school does not aim to develop specialists, but to give general culture and prepare for the duties of life. Those pupils who do not succeed well in mathematics are the ones who ought to give more time and harder study to this subject. In order that this aim may be accomplished every student that finishes the high school course should have completed thorough courses in arithmetic, geometry and algebra. If the pupil goes to college, he will be prepared to take up the more advanced mathematics with no trouble; and, if he does not, he will be sufficiently well acquainted with the mathematical mode of thought, in so far as general culture is concerned. The French Lycées have gone a step further, and require elementary notions of analytic geometry and the calculus as a part of the work of *all* pupils. There is also a strong feeling in Germany in favor of following this example of the French Lycée.

The correlation of the different mathematical subjects among themselves is something that should claim the attention of all earnest teachers. Moore in his presidential address says: "Engineers tell us that in the school, algebra is taught in one water-tight compartment, geometry in another, and physics in another, and that the student learns to appreciate (if ever) only very late the absolutely close connection between these different subjects, and then, if he credits the fraternity of teachers with knowing the closeness of this relation, he blames them most heartily for their unaccountable way of teaching them."

Some authorities go even so far as to advocate no formal study of mathematics

in the high school, but say that mathematics should be developed incidentally in connection with the study of natural phenomena. This, however, is too radical, but it does suggest the close relation between mathematics and physics, and suggests the idea of teaching the two subjects at the same time. Experience has shown that very satisfactory results may be obtained by correlating these two subjects.

The reasoning of algebra is more difficult than geometry; it is more abstract, and less practical, hence it would seem proper to correlate them. If they cannot be correlated the geometry should precede the algebra. Butler says on this subject: "The elements of plane geometry should precede algebra for every reason known to sound educational theory. It is more fundamental, it is more concrete, and it deals with things and their relations rather than with symbols." Although this correlation has been generally suggested by writers and associations, very few changes have been made in the old method of teaching the different branches of mathematics separately. The change can very easily be made. It consists in simply beginning Algebra and Geometry at the outset, and continuing them side by side for two years. In the third year they usually are correlated, so there would be little change there.

Dr. Hanus, of Harvard, suggests the following course in mathematics for a six-year high school course: First and second years (12 to 14), Algebra 2 recitations per week, geometry 2, arithmetic 1; third year, arithmetic 3, geometry 2; fourth year, algebra 2, demonstrations in geometry 3; fifth year, algebra 4, mechanical and geometrical drawing 1; sixth year, solid geometry and trigonometry 5. If arithmetic is to be included in the regular high school course, it should be deferred until the study of Algebra and Geometry are well in hand. The more advanced portions of arithmetic are too difficult for the pupil in the first year of the high school course. The reasoning faculty is not sufficiently developed at that stage to grasp them. If a short course in arithmetic be offered in the third or fourth year, he can readily master it, in the light of algebraic and geometrical principles. Pupils in our commercial departments should have thorough courses in commercial arithmetic. These pupils are actually engaged in business transactions and can grasp the principles of insurance, discount, partial payments and equation of payments, a great deal more readily than those pupils who are not so engaged.

Our pupils should come to the high school with a considerable knowledge of the facts of algebra and geometry. At that time, usually at the age of 14, the pupil should be prepared to take up the study of formal algebra. This subject should be required for five periods a week throughout the first year, and two or three periods throughout the second. This will afford ample time for the mastery of algebra through quadratic equations, and equations of quadratic form. An elective course should be given in the third or fourth year for those pupils who are going to college or the technical school. This course should include quadratic equations, proportion, indeterminate equations, the progressions, binomial theorem for positive integral exponents, and logarithms. If geometry is not coördinated with algebra from the beginning of the high school course, it should not be deferred later than the middle of the second year. It should be carried on for two years occupying about two and a half hours per week. The course in solid geometry should be elective and given during the first half of the last year. This should be followed by a course in trigonometry. This subject enables the pupil to really do things far more than any other subject in the high school. It gives him a sense of practical power through mathematics, which rounds out his course fully. It is quite a revelation to the student when he is enabled to calculate the distance between inaccessible objects, and tell the direction and length of a tunnel before work is begun on it.

The course in high school mathematics has been undergoing a change in recent years which is very much for the better. The course has been abridged and enriched. It has been abridged by omitting from the different branches the more abstract chapters, or deferring many of them to a more advanced stage of the course. The course has been enriched by giving more exercises, and those of a practical nature. Some of the omissions that are especially noted in the later texts are, in arithmetic: G. C. D. and L. C. M. for large numbers other than by factoring, fractions with unusual denominators, compound and complex fractions, all but a very few tables, square root and cube root except by factoring, true discount, partial payments, circulating decimals, equation of payments, compound proportion, and unusual business problems.

Elementary algebra has been much simplified by the omission of H. C. F. other than by factoring, and ratio and proportion otherwise than under fractions. It does not call for cube root; it restricts the use ple cases. It omits indeterminate equa-

of simultaneous quadratic equations to simtions, and inequalities, and deals but little with imaginaries, and the division of one large polynomial by another. While we are not called upon to omit all of these chapters mentioned or even abridge them, we may accomplish better results by leaving out those which are not necessary for the accomplishment of our aim.

We teachers of mathematics have a great work to do. There is a growing appreciation of the fact that mathematics is of all subjects the most difficult to teach. There has been very little work done in the pedagogy of mathematics, except in recent years; but now with the large number of mathematical associations, and the many books appearing on this subject, we may look for a great step forward in the quality of the work done in mathematics in the high school.

There being no time left for the discussion of this paper, the Department now adjourned.

WEDNESDAY AFTERNOON.

IT having been decided by the Association to adjourn to-day, the Department met in its last session at 1:30 p. m. instead of to-morrow morning. The first paper of the afternoon was read by Prof. S. E. Downs, of Brookville, on the subject

THE WAY IN WHICH AN INSPECTOR MAY AID THE HIGH SCHOOLS.

State inspection of high schools has for years been discussed at Pennsylvania educational conventions. The interest manifested in the New Jersey system, as outlined by Inspector Louis Bevier at the Altoona convention of last year; the unanimous recommendation of the high school principals at the Williamsport meeting that a bill relative to such inspection be presented to the legislature; and the efforts recently made by our educational department in this direction, all indicate that our sister states shall not long alone profit by this excellent means of unifying and systematizing our public educational institutions.

"In union there is strength." The nations hold a conference to aid in securing a final universal peace; the commonwealths, though reluctantly, surrender to the Federal Government many of their long reserved privileges; independent manufacturing plants find it profitable to establish gigantic trusts; our intricate networks of railroads combine in systems coextensive with the continent; the leagued forces of evil constantly struggle against those principles which our fathers through the Union hoped to preserve. This association, established fifty-one years ago, has constantly sought to unify the schools of the State; the slumbering rural communities have been aroused from their lethargy; county, city and borough superintendents (responsible to the State Superintendent), have been elected; institutes are daily becoming more powerful agencies for directing thought; laws regulating length of term, teachers' salary, branches of study, sanitary conditions, attendance, establishment of professional teachers' training schools, and the employment and dismissal of teachers, have been enacted.

Even with our as yet but partly unified system the State Department of Public Instruction has recently been able to wield an influence which has made possible the passage, through our tortuous legislative labyrinth of many bills of great importance. Not the least far-reaching are those which provide for the establishment of township high schools, the appropriating of funds for their support, and finally the appropriating of $275,000 for the partial maintenance of borough high schools. That the money thus secured will be used to equip the schools and strengthen the courses there can be no doubt, but the chief value of this law is in the provision which makes it obligatory for the State Superintendent to distribute these funds to such schools as shall comply with his specified regulations.

The advisability of establishing a uniform course of study for high schools, supported in part by the State, was first advocated by the Erie convention just thirty years ago. With the appropriation of the State's funds the legislature assumes added responsibility. It in turn reserves the right to hold the educational department responsible for the use or abuse of additional powers granted. Are the county, city and borough superintendents, with their many local duties, able to furnish such frequent, complete and accurate reports as shall make possible the proper discharge of this obligation? Are those influenced by local pride, hampered by political ambition, and bounded by a limited horizon, always so unfettered as to be able to submit reports which might cause their community to forfeit its appropriation and be, with them, discredited by the state?

This is an age of inspection. State and nation vie in an effort to secure pure food, fair rates and fair play. Through inspection of drainage, water supply and build-

ings under construction, each community aims to protect life, health and property. In bank, mill and mine safeguards are placed about investments and the lives of those employed.

Our Legislature has provided for the rigid enforcement of all laws which produce revenue. Taxes are almost as difficult to avoid as death. Does responsibility cease when the tax has been collected? Millions are expended by state boards without definite legislative enactment; additional millions are appropriated with no provision for increasing the revenue; even in our schools but little responsibility is assumed for the proper use of the appropriations. So far as the State is concerned, a biennial allotment of $15,000,000 may be largely wasted, provided that the schools are kept open seven months, of twenty days each, if properly qualified teachers are legally employed and paid the specified minimum salary, if certain branches are taught, and all children are compelled to attend school, become successfully vaccinated, remain at home or have small-pox.

The chief fault does not lie with the laws which exist; but a failure to meet the additional responsibility which comes with ability to appropriate largely, and failure to provide for adequate inspection by competent and disinterested officials employed by and in behalf of the State, have in many districts resulted in the substitution of State for local funds and the consequent loss of interest and effort in school affairs. In the schools as elsewhere inspection by the power which controls the appropriation is necessary.

State supervision of both common and high schools has passed the experimental stage. Many states have adopted some method of control and not one has, after fair trial, abandoned it. It is possible to make a system so complicated, the paths of advancement so intricate as to retard rather than make the schools more efficient; but we are in no immediate danger of acquiring the faults of the New York system.

With our large population and our thousands of schools, a rigid inspection of the graded schools, such as that of Minnesota, would probably be difficult and unsatisfactory; but should not some uniform course, with a few permitted variations, be adopted for our common schools? Where an attempt is made to accomplish in a course of eight years, in terms of seven months, with poorly qualified teachers in unequipped buildings, the same results as are obtained in courses of eight years of ten months, with specialists as teachers and all modern devices as aids, it is evident that graduation from the common schools and of necessity entrance to the high school cannot indicate any definite stage of development. Not the least unfortunate feature of the present system or lack of system is that which empowers local boards and principals to adopt courses of study (without State inspection), which, if followed, could bring nothing but confusion. Not until, through inspection and examination by properlv qualified State officials, or through some other method which will bring uniformity of gradation, preparation for the high school shall mean a definite equipment, can we hope to unify the High Schools of the State or secure recognition in other educational institutions.

At the present time there are so-called high schools of two, three and four years; there are as many courses as schools; there are schools containing the most useful appliances and others in which the experimental sciences are taught without apparatus; the teachers range in qualification from the experienced university graduate to the unskilled boy or girl holding a provisional certificate. Proficiency in the required studies and ability to graduate are determined exclusively by the principal and local Board of Controllers. It is not remarkable that business houses and professional schools seldom demand high school graduates. It would be folly for college faculties to grant certificate privileges to graduates of all Pennsylvania high schools. Even our State Legislature recognized the unsatisfactory condition of our common and high schools when the State normal schools were established. No graduate of any common or high school in the State of Pennsylvania can legally receive a diploma from any State normal school without first passing in review all studies in which his diploma certifies he has already been proven proficient.

Surely the thousands of children in our State who are compelled to migrate frequently, who each year lose through the overlapping or lack of unity in courses, deserve some recognition. Even in neighboring communities principals find it impossible to grade pupils properly. With a uniform course for the common schools, with a requirement of more years for completing it in districts where the term is short, with state or district inspectors to coöperate with the county superintendents in promoting those qualified to enter the State High Schools, Boards of Education will feel the necessity of better equipment and better instruction. With pupils enter-

ing the high schools thoroughly equipped, the State will be able to outline at least one definite course, the proper following of which may determine the State appropriation.

If competent inspectors were empowered to visit and inspect our borough and township high schools and suggest length of term, length of course, needed equipment, give impressions as to qualifications of teachers, needed changes in buildings, sanitary conditions, salaries paid, etc., and in addition should conduct or assist in local institutes, a commendable rivalry and much interest in the schools and their advancement would result.

If State inspectors and their local assistants were authorized to conduct examinations at the close of a two-, three- or four-years' high school course, and grant State High School diplomas to the graduates of each class, pupils would have an additional powerful incentive to complete their high school education. The overlapping of Grammar School, High School and Normal School would no longer be necessary. Inspection could then be co-extensive with our system of public education, and our unified standards would make additional examinations unnecessary. Colleges and professional schools would gladly articulate with the High Schools of four years and accept credentials without question.

The State could direct, at all stages of development, those energies toward which it appropriates its millions, and could require of all communities which profit by its liberality, a rigid accounting for moneys expended.

Without inspection and partial supervision by legally empowered officials representing those who control the distribution of the State funds, it will be impossible to systematize properly our public schools, and the discretionary power at present granted in full to the local communities will continue to cause divergence and extravagance rather than unity and economy.

SHOULD THE COURSE OF STUDY PRESCRIBED BY LAW FOR TOWNSHIP HIGH SCHOOLS BE CHANGED?

This subject was discussed by Prof. Homer K. Underwood in the following paper:

In beginning this discussion it is important to explain the spirit in which this inquiry was framed and particularly the spirit in which we presume to answer it. The rural high school has come to stay, and preëminently because it subserves a vital and necessary place in the school system of this great Commonwealth. The changes which affect any organization, whether it be educational or not, are *prima facie* evidence of its usefulness. The successful institution must undergo continual modification, if it shall keep pace with the changes in social conditions. The subject of our inquiry, therefore, is not "Shall the township high school be discontinued?" but rather, "Shall the course of study be changed?" This latter idea involves the presumption of advancement and improvement. The spirit of our study is to be constructive and appreciative; not destructive and censorious.

The very first requirement in determining any curriculum is that it shall have an even and correct gradation. This gradation becomes most troublesome in fitting the lower and higher departments together. The principals and teachers of the township need not bewail their fate too bitterly. We have encountered the same vexation in the borough schools. The hue and cry at our educational meetings is still, "How shall we connect the eighth grade with the high school?" Aye, the problem has lately appeared with no less stubbornness in connecting the kindergarten with the primary school. The most general sentiment regarding the course of study as now prescribed for the rural high school is that the work of the first year is too difficult for those who enter. A glance at the group of studies recommended, and at the same time of the ground covered by the average rural grade pupils will make this first objection seem entirely reasonable. The rural high school course for the first year comprises four required subjects, namely—algebra, physical geography, civics and rhetoric—and an elective study of either bookkeeping or Latin. It may be noted that this plan of studies for the first year of the township high school is practically the same as that of the standard borough and city schools. Again, if it is difficult for our grammar school graduates in the boroughs and cities to undertake and carry out successfully such an amount of first year high school work, is it to be wondered that this same barrier should seem even more insurmountable in the country districts? That the elementary training of the country school falls short both in scope and in thoroughness in comparison with that of town schools will hardly be denied. The reasons are well known and require no particular discussion. A short term, a lack of sufficient revenue (and this in turn means a loss of equipment and even teachers) are

the conditions which impair the life and value of the rural schools. And so the one expression which comes from the teachers of the rural school is—that the pupils, who enter the first year, find the work very difficult or perhaps entirely beyond their capacity. Now there is no man or woman in educational work to-day who desires to see our standards lowered, and the natural suggestion in this particular would seem to be, "Why not strengthen the elementary course in the country school until the connection with the rural high school will be close-fitted and natural?" But what in the end may be the best and most desirable is not always the most practical. It will be easier and a more direct solution to this problem if you will not undertake to elevate all the rural elementary schools to a comparatively few township high schools, but rather to organize the course of the township high school in a scale of gradation that is adapted to the elementary school below. After this, the supreme effort should be to strengthen and develop all along the line, so that every link in the chain from the primary school through the high school should be firm and correctly placed.

If we are to accept the recommendation of those who are intimate with the rural high school problem, the group of studies for the beginning of the course should be changed. If it be true that the boy and girl who comes to the township high school is wofully deficient in arithmetic, then we must continue this subject through half the first year instead of algebra. The writer also questions the propriety of physical geography in the first year. This subject is the cause of the most groaning on the part of the first-year students in our borough schools. We have experimented with different texts, and have employed the most expert teachers in the subject, and yet the failures in this department continue to wreck the career of many of our first-year students. On the other hand, we believe that commercial geography, which is more concrete and tangible, might be carried along very prosperously in the first year. Of all the studies which seem to claim recognition in our curriculum, commercial geography has established a most substantial case. Schoolmen are inclined to favor it because they see the value of our young people knowing the physical, social and economic conditions that largely influence commerce, along with understanding the cultivation of the soil.

In the work of English, which very deservedly is given a required place throughout the course, we would suggest that the introductory study should be devoted to composition and a study of the classics, and that the presentation of the formal principles of rhetoric may well be deferred until the second year. The study of English should be a kind of armature or medium for a current of lively interest which shall polarize all the studies and work of the first year. Toward the end of the term, a review of grammar might well occupy six or eight weeks' time, and thus interest will be maintained and a good foundation laid for the serious work in English which is to follow.

Another very radical change which our convictions urge us to propose in this prescribed course of study is, the elimination of the bookkeeping which is offered as an equivalent for Latin in the first two years. Those who are familiar with the methods and problems of the average high school whose enrollment is below 75 or 100, have discovered that the limited training and efficiency which the commercial branches appear to give, does not warrant the expenditure in time or school supplies which are involved. We have heard this analysis of the situation a hundred times from the lips of principals who represent high schools of the size indicated a moment ago. Here will be less than a half dozen students in the entire school who are to become expert (?) bookkeepers in the face of the most untoward conditions. First of all there is no one in the faculty who is capable of teaching the subject as it should be taught or as it is being taught in our best business schools. The boy or girl is in no better position than he who joins the so-called correspondence schools and begins work alone. There are advantages which accrue from a large class where actual business transactions are taking place, and where a school bank is in operation. These conditions will only be found in the city high schools where the commercial department is entirely complete and where the posting of books (which I understand is considered lowest in the scale of importance) is supplemented with practice in typewriting, stenography and commercial law. If the boy or girl in the township desires to equip himself for immediate employment in the commercial world, let him learn typewriting and stenography and not bookkeeping first. And as far as the former branches are concerned, we feel almost positive in asserting that the merchant or employer will tell our young friend that he prefers a clerk who did not receive this training in the rural high school.

Having eliminated the bookkeeping as an optional fifth subject in the first two years, what are we to do? Latin is the only alternate indicated in the schedule. Shall we adopt this or something else? And now we are confronted with the old subject of contention which is interjected into every discussion of what shall constitute the courses of the secondary schools. The marvelous material advancement of our country and more especially the achievements which have been wrought along scientific lines, have influenced the public mind against a study of the humanities. It is outside the scope of this paper to go into discussion of the contest. The writer, however, is in a position where he cannot dodge the issue; nor does he even care to do so. We are in loyal allegiance with the humanists and our recommendation in the matter as it affects the township high school as well as the borough high school) is an earnest plea to keep the Latin. A policy which is now in operation in many of the very best high schools might be employed to good advantage in the townships of Pennsylvania. It makes Latin a required subject through the first two years and an elective in the third and fourth. The plan besides being almost universally acceptable to those who are opposed to a complete classical curriculum, has a sound pedagogical basis. It is immensely important, if not essential, that our young people (who regard the high school as the peoples' college) should become acquainted with a language other than their own. They can in two years' study of the Latin come to realize the general tendency of all languages to change from a synthetic to an analytic structure. The argument in behalf of Latin on the ground that it gives a student a wider and more accurate use of English words may be moss-grown now-a-days, but the hard rock of truth lies underneath. Thus the study of Latin for the first two years may be advocated for reasons entirely independent of college preparation. Again there must be provision for these boys and girls who are to take up college courses. It is ridiculous to presume that every boy who enters the township high school is an embryo farmer or agriculturist. In fact the registrars of all our colleges in western Pennsylvania will tell you that a large percentage of the students come to them from the country districts. There used to be a sentiment that these humble industrious country folk attached greater value to an education than their city contemporaries. Dr. Landreth, an eminent clergyman of the Cumberland Presbyterion Church, in a recent address before the alumni of Washington and Jefferson College, complimented the trustees and faculty of the famous institution because they were holding fast to a classical curriculum, and had not been carried away with the fetich of industrial and utilitarian education. He said he had attended a meeting where the "wild-eyed and wild-idea'd" exponents of a purely utilitarian training were repudiating the value of cultural institutions. One orator in particular arose and said with considerable fervor that he wanted to send his son to a college where he could learn to milk a cow. An unknown auditor in the rear of the room, who presumably believed in the good old-fashioned classical training, called out, "Right you are, brother, but I would prefer them to teach him something that a calf cannot do better." In the township high school course we would require Latin as the fifth required subject in the first and second year, offering Cicero and Virgil as electives during the last two years, especially for the benefit of those who are providing college entrance requirements. A trial of this particular arrangement will reveal another gratifying situation, namely—that many of the boys and girls who do not contemplate entering the university will continue their study of Latin throughout the high school course.

We have, however, allowed an elective in place of Latin during the last two years. According to the present prescribed course, the alternative is a "review of the common branches" in the third year, and commercial arithmetic in the last year. We are willing to concur with the idea of reviewing the common branches, but would not oppose the introduction of a different subject here. Some schoolmen favor a two-years' course in German which may be adopted very acceptably as the elective with Latin in both the third and fourth years. The objection may be raised that it would be a serious problem to find a teacher for this modern language. On the other hand we do not see that any special difficulty ought to arise after all. The teachers in any high school should be "college graduates." Many of these graduates have not only studied German throughout their course, but have afterwards excelled the old type of native German professor in teaching the language in high schools and colleges.

A few more suggestions regarding the plan of studies are required in view of the changes already indicated. Commercial geography having been substituted for physical geography in the first year, we

the conditions which impair the life and value of the rural schools. And so the one expression which comes from the teachers of the rural school is—that the pupils, who enter the first year, find the work very difficult or perhaps entirely beyond their capacity. Now there is no man or woman in educational work to-day who desires to see our standards lowered, and the natural suggestion in this particular would seem to be, "Why not strengthen the elementary course in the country school until the connection with the rural high school will be close-fitted and natural?" But what in the end may be the best and most desirable is not always the most practical. It will be easier and a more direct solution to this problem if you will not undertake to elevate all the rural elementary schools to a comparatively few township high schools, but rather to organize the course of the township high school in a scale of gradation that is adapted to the elementary school below. After this, the supreme effort should be to strengthen and develop all along the line, so that every link in the chain from the primary school through the high school should be firm and correctly placed.

If we are to accept the recommendation of those who are intimate with the rural high school problem, the group of studies for the beginning of the course should be changed. If it be true that the boy and girl who comes to the township high school is wofully deficient in arithmetic, then we must continue this subject through half the first year instead of algebra. The writer also questions the propriety of physical geography in the first year. This subject is the cause of the most groaning on the part of the first-year students in our borough schools. We have experimented with different texts, and have employed the most expert teachers in the subject, and yet the failures in this department continue to wreck the career of many of our first-year students. On the other hand, we believe that commercial geography, which is more concrete and tangible, might be carried along very prosperously in the first year. Of all the studies which seem to claim recognition in our curriculum, commercial geography has established a most substantial case. Schoolmen are inclined to favor it because they see the value of our young people knowing the physical, social and economic conditions that largely influence commerce, along with understanding the cultivation of the soil.

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would recommend that the latter subject should now be substituted for botany-zoölogy in the second year. Coming again to the fourth and last year of the course, we are obliged to make a choice between chemistry and the botany-zoölogy which have been held over. We think that the consensus of opinion will here favor the elimination of chemistry. The subject is valuable, but at the same time involves the provision of a laboratory, with an expert instructor in charge. An inspection of the high schools throughout the state will show that in the majority of cases where chemistry is taught, the work is in the hands of a teacher who has specialized in the subject, and who assumes direction of no other branch except the physics. So the economic factor enters the problem at this stage, and in nine cases out of ten the board of directors will favor the substitution of botany-zoölgy. Again this course may become as attractive and valuable as the chemistry. Instruction in agricultural science and the elementary principles of political economy may be properly and usefully correlated, and thus comprise a year's work which would be immensely valuable and practical. In either of these combinations botany-zoölogy or agriculture and political economy, the work could be brought down to the level of high school students, at least to those who have reached the fourth year.

And now we have compassed the work of the entire course of studies prescribed in the rural high school. The changes recommended are not sweeping. Indeed they mean scarcely more than a reorganization of the branches and groups as they were originally selected. In conclusion the writer begs to emphasize the fact that he does not wish to appear arbitrary. He was requested to offer his individual convictions upon a question that has a diversity of answers. If in the conclusions that he has drawn he has been able to provoke a wider interest and discussion on the subject of the township high school, surely there may be some good come of it.

Prof. H. S. Kuder, of Canonsburg, continued the discussion in the following paper:

WHAT ARE THE NEEDS OF THE TOWNSHIP HIGH SCHOOL?

Ladies and Gentlemen: A few weeks ago, in a speech at Lansing, Michigan, the President of the United States paid a grand tribute to the American farmer. He said, "If there is one lesson taught by history, it is that the permanent greatness of any state must ultimately depend more upon the character of its country population than upon anything else. In every great crisis of the past, a peculiar dependence has had to be placed upon the farming population, and this dependence has hitherto been justified." These were surely words to make glad the heart of every tiller of the soil; and yet in the same address, the president made the statement that "the social or community life of the country people in the east compares less well than it formerly did with that of dwellers in the cities." Now, while this may be and probably is true of some places, I do not believe that conditions in Western Pennsylvania will justify such a declaration. I am optimistic enough to see that there has been even greater improvement in the social life, particularly the educational life, in the country than in the cities; and at no time has the progress been as rapid as at present. And further, I believe that one of the most potent agencies in bringing this about has been the township high school.

Some years ago when the matter of higher education in the rural districts was before our people for the first time, the question was asked whether it would be possible to maintain high schools in the sparsely settled country districts; or if possible would it be at all profitable? Would it pay? How often that question or the answer to it has determined action in this busy world! Would it pay in dollars and cents? There was but one way to find out. The earliest trials gave the answer satisfactorily. It was found possible to have a high school practically wherever one was desired. Nor was it difficult to maintain them after they were once established. Their permanency was assured because it paid to have them.

But the township high school is still in its infancy. And even were that not so, we must ever bear in mind that no human system of education or anything else ever reaches the point where there is no chance for improvement. Education is a science and as such must always be in part experimental. Perfection is the goal to be aimed at, but which can never be reached by any science. And so the fact that the township high school has been, almost without exception, eminently successful should not blind us to the truth that there are some things which are needed for the betterment of the schools. It is my duty and pleasure to point out some of these.

The demand coming from all high schools in the state is for better preparation of those who desire to begin the work. The rural high school is not an exception in

this respect; in fact, the lack of sufficient preparation is one of the most serious evils with which we have to contend. At first one might think that this could be remedied by keeping the children in the common schools until they became fully prepared, but it is not so. The fault is in those common schools, and you cannot get from them what is not in them. Can a corrupt tree bear good fruit? The child has experienced the methods of from five to ten different teachers no one of whom bore any definite professional relation to the others. There was an absolute lack of continuity in his common school course. Is it surprising then that he is not fully prepared for high school after eight or ten years of this demoralizing lack of system? A remedy for this condition is needed not only by the high school but by the common schools themselves. Remembering that the high school must not descend to the level of the ungraded schools, but that it must lift these schools up to its own standard, we find only one plan which gives promise of improving conditions. Let the high school principal be supervising principal of the township schools as well. Let him prepare or adopt a course of study for the ungraded schools which will have the definite aim of preparing those who complete it for the high school. And let the principal see that this course is followed. This, together with a less frequent change of teachers and the coöperation of parents and teachers, ought to bring about a great change for the better. Nor is it any Utopian scheme, but one entirely practicable. Try it, and one of the greatest needs of the high school in the country district will be met.

Not alone on the part of the pupil is better preparation to be insisted upon, but we also need better prepared teachers and more of them. The teachers that just happen from any one of half a dozen reasons to get into the high school are not the ones to carry the work to a successful issue. There must be special preparation to meet even the requirements of the law. You have read that section of our school law that states that the township high school, in order to receive aid from the state, must have at least one teacher "legally certified to teach bookkeeping; civics; general history; algebra; geometry; trigonometry, including plane surveying; rhetoric; English literature; Latin, including Cæsar, Virgil, and Cicero; and the elements of physics; chemistry, including the chemistry of soils; botany; geology and zoölogy, including entomolo[illegible]

"And still they gazed and still the wonder grew
That one small head could carry all he knew."

And yet this is what the township high schools need—teachers not only "legally certified" but mentally qualified to teach the branches enumerated in the law.

Now, it is a mistake to expect any one teacher, to do efficient work in all of these departments. At least two teachers, and, where possible, three teachers are needed in the township high school; three especially where the principal of the high school also has charge of the other township schools.

Here, too, we note another need of these schools. A teacher specially prepared for this work will be able to demand a higher salary than is now paid by the majority of the township high schools. What then is to be done? Such salaries must be paid as will draw capable men irresistably into these schools. And why not? We believe our country boys and girls are worth as much as any others. Then, why not pay as much or more for their education? The legislature has paved the way for greater liberality in salaries by the appropriations made at its last session. It is now incumbent upon the directors to keep the good work going.

Every township high school needs a library. Fortunately a way has been provided by the establishment of the Free Library Commission, whereby each school can secure a set of books that may be exchanged from time to time. I believe that this commission should also be empowered to furnish to rural high schools suitable collections of scientific apparatus to aid the teaching of those scientific branches that have been included in the high school course of study.

I believe our present course of study for the rural high schools is a good one. However, the fact that the township high school is in most cases a finishing school and not merely a preparatory school, gives rise to some criticism of the course of study. As to this, I shall only mention a few remarks made to me, to show the view which some of our people take of the high school. A blacksmith said to me, "How much Latin will it take to fit my son to shoe a horse or mule?" A farmer doubted whether his boys could run the farm any better with a knowledge of algebra than without such knowledge. A miller and a storekeeper desired a course of study that would provide the essentials of a business education. And the oldest resident wondered, as he sat on the cracker barrel, why girls, after graduating from the high

school, had to attend some other school before being qualified to teach in the common schools. And yet, all of these will agree that it is unreasonable to expect the high school to combine the functions of the technical school, the agricultural college, the normal school, the business college, and the classical academy. What we need here is to educate the people to believe, as Superintendent Schaeffer says: "The high school cannot supply all the essentials of bread-winning and fortune getting. There are many things essential to success which must be learned outside of the school and beyond the school."

There is a great future before the township high school. It is extending opportunities to the country children of all classes such as twenty-five years ago were open only to the children of the rich. As the great good that it is doing is more fully realized by those for whom it was established, so then will it be more enthusiastically supported and all its needs will be supplied.

The mission of the high school is to place high ideals before the youth of our land, and to lead them in the way of righteousness. And let the teacher in the township high school be mindful of the importance of those in his care. Build up the character of the nation's best citizens, the country boys and girls.

Superintendent Spayd: As to the law signed January 15, extending the privileges of townships to boroughs, we who are looking for high school principals would like to know where we stand.

Superintendent Breidinger: No one seems to know.

Superintendent Spayd: The law appropriates $275,000 to borough high schools. Are the qualifications for a high school principal and the course of study to be the same as under the township high school law?

Mr. Teitrick: Yes. The course is the same with some slight modifications. Qualifications for principalship are the same. Dr. Schaeffer has issued a circular giving the necessary information.

Superintendent Richie: Several things have been said here which merit our attention. The criticism is made that pupils often come up to our high schools unprepared. This is a serious charge, because, in my opinion, it is not true. The trouble is with the high schools. It is simply impossible for pupils coming from the small classes found in the grammar schools to do good work in the large classes of the high school, when they must take up the large number of new subjects which are on the course for the Freshman classes of most high schools. As things are now, as much work is demanded of the Freshman as of the Senior class, the only difference being in subjects of study. We take pupils just out of the grammar school and put them into Latin, and rush them along, with the result that in eight weeks they are lost. When we ask the Freshman class to complete algebra in one year we ask an impossibility. And yet, if we keep these pupils in the grammar grade until they are old enough to handle this work they will be lost to us. What we want to do is to go slower in the Freshman class and all will be well. It is easy to criticize. Each grade blames the trouble on the grade below, until the kindergarten teacher must blame any faults in her pupils on the human race. Too much work is required in high schools where there are but a few teachers. The Committee of Ten defined what a high school is, and I am surprised that there is any longer any question about it. Let every high school adopt their course, and go as far as they can with it as it is laid down. Pupils who want more can then attend another school. No subjects in the curriculum take the place of Latin and Greek in educative value. The study of these subjects compels constant comparison and drawing of conclusions on the part of the pupil as he translates. This training is good alike for the farmer and the college student.

Superintendent Buehrle: The Legislature in framing that township high school law evidently thought only of financial success as the main object of education. No arts are included. The most magnificent of the sciences—astronomy—is not mentioned. We must teach pupils not so much what they want as what they need, not so much how to get a living as to live. We are all agreed that there is an English language. Most of us try to speak and write it. But the method and apparatus for the study of English are not yet perfected, whereas both are perfect in the study of Latin and Greek. Very few professors of English in the schools rank with the Latin or Greek teacher. English usually is given to an inferior teacher. It must also be remembered that there is a language called German, although it has not yet been mentioned here. But the fact that in the Encyclopedia Brittanica there are three times as many references to German works as to English and French works seems to indicate that the best scientific and philosophical works are written in that language. German to-day is, next to English, the language most widely dispersed

over the world. Therefore, in considering the high school curriculum it ought not to be overlooked.

Professor Breidinger: We high school people are criticized for certifying graduates to the colleges who were weak in English. This can not be helped. Not all of our pupils can reach the same standard of excellence. Some can, but others can not. It ought also to be remembered that those pupils who are the weakest in English are those who come from homes where the language is not correctly used. It is almost impossible to eradicate these bad habits. In moments of excitement the pupils will revert to the old, improper forms of speech. Often such pupils do fine work in other languages or in mathematics. Ought they to be held back on account of their early misfortune?

It was now announced that the next meeting of this department would take place in Harrisburg, December 26, 27 and 28. No election of officers was held, the present officers holding over until the Harrisburg meeting.

The department then adjourned.

NATURE STUDY DEPARTMENT.

THE Nature Study Department of the State Association met at 8 o'clock on Wednesday morning, July 3, in one of the spacious class rooms of the High School building. Dr. George Park Singer, of the Lock Haven State Normal School in the chair.

After some pleasant opening remarks he introduced Supt. Samuel H. Dean, of Mount Carmel, who read the following paper on "Common Rocks and Stones," giving as he proceeded a carefully detailed and very interesting description and explanation of the striking features of the different specimens shown to the members of the department.

COMMON ROCKS AND STONES.

Nature study is a fad or not a fad according to what is done. Of books on this subject we find few that are simple and within the reach of the ordinary teacher. In our town our work has been to try to study the things about us, and to simplify the work so that all may learn how to ask nature such questions as will cause her to open her rich stores to us. We have desired to use home material. Some few topics have been taught for the benefit of the teacher and not to burden the child. Each teacher is trying to touch on these more or less according to the grade she teaches. The various things are to be used in field lessons and winter school room lessons. When a teacher has the ability to present the facts so as to arouse great interest or to arouse curiosity the children become familiar with much with little effort.

Some of the purposes of these lines of work are to develop the powers of observation, comparison, and judgment. But more important than anything else is the desire to see, and love, and understand nature, and to love to commune with her and to form such a habit of questioning her that all the remainder of life it will be impossible to cease communing with her. Teachers may know some things that the children do not know; and they can know them in an unscientific simple way, so as not to be burdensome.

Some of the common crystal forms are the cube, rhombohedral (like a box out of shape by blow on corner), hexagonal, pyramidal, etc. The leading characteristics are:

1. Cohesion and Elasticity: Cleavage and Fracture, Hardness and Tenacity.
   Cleavage—Basal, and in different directions; liminæ, plainly marked or not so easily seen.
   Fracture—Conchoidal; even or uneven; hackley.
   Scale of Hardness—(1) Talc, or crayon or hard soap, test with thumb nail; (2) Gypsum, test with thumb nail; (3) Calcite (marble), knife scratches easily; (4) Fluorite, test with knife; (5) Apatite, test with knife; (6) Feldspar, knife scratches with great difficulty; (7) Quartz, scratched by file, scratches glass; (8) Topaz; (9) Sapphire or Corundum; (10) Diamond.
   Tenacity—Brittle, sectile, malleable, elastic.
2. Mass and Volume—Specific gravity, weight, ordinary, light, heavy.
3. Light—Color, luster, streak.
4. Heat.
5. Electricity and magnetism.
6. Action of senses—Taste, feel.
7. Solubility.

The above topics are not complete but are all that are needed for a very good working outfit. They place us in close touch with what we may call the inner structure of the mineral by a few simple observations. For our district it is astonishing how few tests will determine every rock and mineral about us. Children are very curious as to things if they have been well taught. Where dirt came

from and what it is, are not uncommon questions. The dry statement that so much of the earth's surface is water and so much land counts for little, if that is all that is thought of. Let the child see that on land there is wearing, and in the water there is building, of new continents for future generations. Let the child consider the ocean God's great factory, and the interior of the earth his great storehouse from which he occasionally opens a crack and lets out a small sample, in the form of a dyke, and you have planted seeds of confidence and trust in the God of the universe.

The earth is about three-elevenths land and eight-elevenths water. The land is the place of destruction and the water the place of construction.

The relative terms of wearing, as results of this destruction constantly going on, are rocks, bowlders, cobblestones, pebbles, sand, dirt, clay, silt, mud, loam, soil and mineral waters. In the work of construction (stone forming) we have conglomerate (pudding-stone) made from bowlders, cobblestones and pebbles; sandstone and slate from sand, dirt and clay; and limestone from mineral waters.

Rocks, as to origin, are divided into Igneous, Metamorphic and Sedimentary. When cracks in them are filled by water they are called a vein, and a dyke, or dike, when filled by molten matter.

Objects about us in nature, with which we are more or less familiar, as minerals, metals, etc., have their distinct characteristics, by which they are recognized and known. These may readily be learned in their qualities and by their names. It is a delight to bright young minds so fortunate as to be waked up by an intelligent teacher alive with interest in all three of the great kingdoms of nature, to go about in God's vast Museum of Wonders putting questions to everything—and having some of them answered so definitely, so clearly, as to satisfy his own intelligence. We need teachers who can give pupils a chance to learn at first hand of the world about them. The characteristics—readily recognized—of certain minerals, etc., are as follows:

Quartz: Hardness 7, scratches glass easily, no cleavage, luster glassy, crystals hexagonal, insoluble in acid, most abundant of minerals, seen in Flint, Jasper, Chalcedony, and Granite. On account of its hardness it opposes erosion and is a large part of sand, pebbles, sandstone, conglomerate, etc.

Feldspar: Hardness 6, cleavage easily seen, flesh color, both pink and white, common, luster glassy.

Calcite: Hardness 2, crystals and cleavage rhombohedral, soluble in acid, double refraction, very common. Marble.

Mica: Hardness 2, cleavage basal, laminæ, elastic, luster pearly.

Pyrite (Fool's Gold): Hardness 6, brittle (gold is sectile), brass yellow, crystals about her are cubes, luster metallic, gravity 5, streak green. Strike fire on steel.

Garnet: Hardness 7, gravity .75, streak white, brittle, luster glassy to resinous.

Salt: Hardness 2.5, gravity 2, luster glassy, streak white, taste, soluble in water, brittle, crystals cubes.

Some Iron Ores: Hematite, red streak; Limonite, brownish yellow streak; Magnetite, black streak.

Some Coals: Anthracite; Bituminous, caking, non-caking, cannel, brown.

Granite is made of quartz, feldspar and mica; Syenite of quartz, feldspar and hornblende.

The children should know the minerals about their town by sight just as they know ice, coal, etc. The more advanced pupils will be interested in seeing why they know a certain mineral to be what it is. Had the early settlers of Virginia noticed that pyrite is brittle and gold sectile they would not have loaded a ship with "fool's gold." Quartz is very hard and has no cleavage. Feldspar is very hard and has clearly marked cleavage. Calcite is soft and has cleavage and thus we can easily distinguish them one from another. Very much interest may be secured by both school and individual collections.

Crystals have great beauty to a thoughtful teacher, and there are touches that can be given that will not be forgotten. The clear crystal with its mathematical exactness has eliminated foreign material. It illustrates the old saying, in a new way that appeals to the pupils, "Birds of a feather do flock together." Gold does seek gold, and diamond does seek diamond, and just as mathematically does the good seek the good.

The following excellent discussion of "The Vital Element in Nature Study" was read by Miss Anna M. Deens, principal of science in the normal department of the Fifth Avenue high school, Pittsburg. She strongly urged taking the children out where they may have a chance to learn things for themselves, and so, in time, acquire habits of observation and inquiry without the direction of the teacher.

VITAL ELEMENT IN NATURE STUDY.

The study of living things has been reduced to a science often pursued by na-

ure's closest adherents under the title of Nature Study. Whether this study concerns the child energized in his every act, the teacher imbued with enthusiasm, the myriads of alert creatures with which nature teems, or the manifold manifestations of force, the nucleus around which all interest centers is the vital principle.

This life phase of Nature personally appeals to us in the teacher's energy, and the student's activity, and comprehends the relation of both to their natural surroundings. How to infuse this vital force, how to transform, and how to direct it toward effective expression are worth consideration.

As an *educative feature* in school work, nature study presents a field so vast, an array so bewildering, as to seem at first glance impracticable of presentation; and unless simplified and adapted according to nature's own design it bids fair to drift into disfavor. Yet with the the steadily increasing company of staunch adherents thoroughly imbued with the love of nature, setting forth in earnest, persistent effort its rightful claim, this subject cannot fail of recognition as the leaven for the whole course of study.

A searching review of the subject, to serve as a test of fitness for position on the curriculum, reveals the already well-established fact that contact with nature not only involves direct sense-training, but, in data thus furnished, affords the correct basis for all mental processes.

The modern trend of nature study subordinates subject-matter and method to the motive involved. The motive is the essential element, since it concerns the individual in his relation to the world around him, his personal need, and nature's means of supplying such need.

Conditions conducive to education are certainly reflex, and it is the province of the parent and the teacher to seek out the best means of placing the child under such influences as shall contribute to his development. The attainment and maintenance of favorable conditions furnish a problem in rational, effective education which merits the speedy and continued attention of the department of school administration. Any management which fails to provide schedule time, work-room space and equipment, or means of transportation to bring children into direct contact with nature is deficient, and therein is responsible for not achieving in full measure the primary purposes for which schools are instituted—the acquisition of knowledge and the development of power.

Some helpful suggestions for affording ideal conditions are offered by Dr. A. J. Grout in the *Plant World* of December, 1906, in which he advocates ownership of tracts of land within reasonable reach by trolley to which classes may be transported for field work.

Some measures that have proven satisfactory and efficient in out-door work in connection with the Normal High School of Pittsburg are here enumerated, and will be explained later and offered for discussion. These include:

1. Taking of classes into available regions, at permission of owners, for study of plants and animals.
2. Visits to Park nurseries, propagating houses and conservatories.
3. Practical lessons in Phipps Hall of Botany, given on material furnished by park authorities, including native and cultivated plants.
4. Observation of living animals in the Zoölogical Gardens.
5. Birding excursions.
6. Museum visits for studying exhibits of special import.

The spirit of the work involves an intelligent mutual interest in common objects presented in the daily round of life, the teacher serving as guide to direct the pupil's activities, and with him to enter into a spirit of investigation concerning nature's secrets, both "trying, with uncertain key, door by door of mystery."

Discouragement to teachers in this line of work too often grows out of their effort to keep the standard of attainment too high, as evidenced by grade, or ground covered in the text rather than by the awakening of the powers of the student; and often too, in the confusion arising from the lavish supply of material furnished in nature, the work grows complex and laborious. Let the aim be simplified, definite; have material carefully selected; and the method adapted to the material furnished and to the capacity of the student.

The teacher must exert his most potent influence, in infusing spirit, not into the school exercise, but into the pupils. The pupils themselves will make the exercise scheduled as "nature study hour" spirited enough when awakened, and often their willing response to any opportunity to see, or to express themselves concerning objects presented for observation and discussion is evidence of their innate "gift of the spirit."

Effectiveness of work may be increased by the student's own effort. Every child passes through the collecting stage, and seeks to know the meaning of his collection.

His attention simply needs to be directed into the proper channel for answering his own query. The teacher may figure as a companion in the search, thus stimulating interest, and awakening endeavor. In such coöperation a teacher may decipher the true character of a child's interests. Think you the teacher drops from his dignity in such mutual effort? If so, recall the revered teacher whose centennial we have so recently observed, when

> "Said the Teacher to the youth,
> We have come in search of truth."

No teacher is a complete compendium of knowledge—and if he were he would probably be but poorly fitted to impart information—but he may be a touchstone of inspiration. The supposition of total ignorance of either pupil or teacher is ungrounded, and discouragement because of limitations is detrimental. The past experience of both teacher and pupil should count as basal material for progress, but must be revived and supplemented by new material from nature's storehouse. From infancy the child has been making the acquaintance of objects that attract his attention, distinguishing their qualities and learning their names. Tireless in observation, and insistent in inquiry, he makes rapid strides in a few years. Subsequent suppression of this natural tendency is to be deplored. Latent impressions should be discovered and linked to those of recent observation. These related experiences when organized furnish a fund of knowledge, and power to achieve further knowledge.

The preliminary step in nature study is training in observation. Association with companions themselves habituated to the simple practice of seeing aright is a powerful stimulus in this direction. But skilled observers as parents and even as teachers are rare. If elders fail to furnish congenial companionship through lack of fitness or adaptability certainly they should place the child in a sympathetic atmosphere in which he may follow unhampered his natural bent to expand his own powers. In a favorable field every step furnishes opportunity for observation. Not only does the country furnish the materials for the exercise of this power, but the home, the market, and the emporiums of merchandise, with their endless chain of attractive objects which seize upon the child's attention, and stimulate his inquiry, offer a boundless sphere for investigation.

Our cities are centers furnishing abundant if not adequate opportunity to observe. Parks, zoölogical gardens, conservatories, museums, art galleries, libraries, are forceful institutions for stimulating this power under definite direction. It is here perhaps that city schools have an advantage, but we must not forget that this same source—the city—affords crowded courts and tenements, hot, dry area-ways devoid of natural life and living conditions.

The city is a phase of nature but not nature elemental, and spirit here infused is as "water unto wine." The source of knowledge is nature's fount, and from the clear waters of this spring will be reflected the answer to each question which it becomes the child's problem to solve in life's lessons.

To get the children into touch with nature is of prime importance in the development of body, mind and character. Get them into the country by some means; simplify food and clothing. Happily the material things of life are neither scarce nor beyond reach in price. Children exemplify in their wants the "simple life," and are not hard to satisfy. Exponents of life in motion, of natural forces unhampered, they rebel against the restrictions of artificial life. A little planning in the home and a little mutual helpfulness in which the child would willingly share will furnish the necessary means for a vacation in the country. Fresh air funds will afford less fortunate children an outing. Some way can be found.

Charles Skinner tells us why such experience is essential when he says: "We must have known the country in our youth to revive it in our memories. Having seen the country in our childhood, having breathed it, having smelled it, having rolled in its grass and snow, having swung in its trees, having eaten its fruit, and drunk of its springs, *having been in touch with its spirit*, it is ours for aye."

Nor can the teacher be exempt from such influence if he would keep the heart fresh and would present not only to the student world, but in the broader walks of life a genial spirit, a broad sympathetic nature. When the brain is exhausted with strain, and the mind wearied with conflict, nature will enfold in a mantle of peace, until one catches the keynote of nature's harmony, and yields the citadel of discord to a reign of recreation and rest.

This is a plea for teachers employing their vacation periods in nature's wonderland afar from flurry and the "madding crowd"; and for daily leisure which it is the birthright of the student-teacher to enjoy. Periods exempt from routine duty should be allotted and should be as zeal-

ously guarded as hours of preparation and presentation of work. Assignment of work which does not look far enough ahead to measure the reflex influence of a mind at leisure, fails to comprehend the expansive influence of the *spirit* in teaching, and Dr. Woodrow Wilson affirms that education is a matter of the spirit.

To have come within the range of inspiration, to have lived responsive to nature's hidden influence is to hold implanted sentiment, which becomes the inspiration of a rich full life.

Relation of Literature to Nature Study and the Basis of Selection of Appropriate Reading Material.

After exploring Nature's wonderland, excursions aside into the field of literature will round out and make permanent each delightful experience.

Appropriate reading material for emphasizing and unifying field work and other practical lessons in nature study should be selected from the viewpoint.

1. Of literary merit. It should be vividly descriptive, and should express ennobling sentiment. Pictures of life portrayed in literature appeal strongly in their representative power, and stir the emotions to the deeper significance of nature's meaning.

2. Of information. The facts set forth in any work should not be so highly embellished as to veneer the truth, nor should they be at variance with the result of the student's observation, correctly made. Hence great care should be taken in the selection of books, on the basis of reliable information furnished.

3. Of intimate acquaintance with "God's out-of-doors." Nothing can compensate for a lack of the vital element in literature—the touch of the mystic spirit.

As a test of the mutual aid afforded in literature and nature study, go with Mabie into the "Forest of Arden," "and feel its spell come upon you"; rest with him "Under the Trees," neath the orchard bough, whose pink-tinted, perfumed petals "sift down" from the massive bloom o'erhead, and with the delight of a new experience in your heart tread on "with feet to earth" in company with Charles Skinner, entering with him into the "joy of viewing nature as a mere spectacle rather than as phenomena"; or take, with Torrey, a "Rambler's Lease"; or traverse with Burroughs the "Ways of Nature."

Sit with Van Dyck on the banks of the "Little Rivers," yielding to the sweet influence of companionship; or wander with Whittier along the "shallow brook" crossing by the "stepping stones" into a region

> "Rich in flowers and trees;
> Humming-birds and honey-bees."

Go "nutting," with Wordsworth, "into the shady nook of hazels," noting his warning against "ungracious signs of devastation," when he adds, as if in extenuation of his own "merciless ravage in dragging to earth both branch and bough with tempting cluster hung," "With gentle hand touch—for there's a spirit in the wood"; perhaps an avenging spirit for the "mutilated bower."

With the incomparable Maeterlinck project yourself into the "Life of the Bee."

Join with Gene Stratton-Porter in the "Song of the Cardinal" in all its variations from its exultant "Good cheer"! to the tenderly intoned "so dear!"

Live awhile with Quayle in "God's Out-of-Doors," recalling Robert Louis Stevenson's testimony—"No house like God's out-of-doors"; and no one better fitted than he, from the depth of experience, to give utterance to the truth involved.

When wearied with your ramble, bend with Agassiz over the open page, as when

> "Nature, the old nurse, took
> The child upon her knee,
> Saying; 'Here is a story book
> Thy Father hath written for thee.'"

Surely thus one may grow into a "Child of Nature," exclaiming with Longfellow,

> "Through every fibre of my brain
> Through every nerve, through every vein,
> I feel the electric thrill, the touch
> Of life that seems almost too much."

Miss Deans was requested by a number of persons who heard her paper to prepare a list of good books of reference and publish the same in this connection. She names the following:

Field Book of American Wild Flowers, and Field Book of Wild Birds and their Music, by F. Schuyler Matheus.

Familiar Trees and their Leaves, Trees of Northeastern America, Shrubs of Northeastern America, and Vines of Northeastern America, by Charles Newhall.

The above are published by G. P. Putnam, New York.

Nature's Garden and Bird Neighbors, by Nettie Blanchan; and Bird Homes, by Dugmore. These three books are published by Doubleday, Page & Company.

Birds of Eastern North America, by Frank Chapman. Published by Appleton & Company.

Sea-Beach at Ebb-Tide, by Augusta

Foote Arnold. Published by the Century Company.

After the reading of the above paper Miss Anna M. Deans was elected president and Miss Mazie L. Eckhardt, of Altoona, Secretary of the department for the ensuing year.

KINDERGARTEN DEPARTMENT.

THE meeting in the interest of the Kindergarten department of the State Educational Association was held at nine o'clock in one of the classrooms of the high school building. Miss Elizabeth Culp, Supervisor of the Pittsburg and Allegheny Kintergarten, as president, stated the purpose of these meetings.

Miss Cora E. Hicks read a paper on the "Value of the Kindergarten to the Community." We have not received a copy of this paper, and are therefore unable to present it in this report.

Miss Culp gave a very interesting talk upon the child's drawings, as made in the Kindergarten, illustrating her remarks with the work of the children. The idea expressed in the drawings, and the courage to express it is what gives value to the child's work.

Miss Ellen Ruth Boyce, of Pittsburg, was elected chairman and Miss Cora E. Hicks, of Altoona, secretary and treasurer for the ensuing year.

Miss Elizabeth Culp read the following paper upon "Froebel, the Founder of the Kindergarten: His Life, Philosophy, Psychology, and the Kindergarten."

FROEBEL: FOUNDER OF THE KINDERGARTEN.

A fair-minded critic, and one whose judgment is most sane, Robert Hebert Quick, has given the following tribute to Froebel's right to an honored place in Time's Hall of Fame: "All the best tendencies of modern thought on education seem to me to culminate in what was said and done by Friedrich Froebel, and I have little doubt that he has shown the right road for further advance. There are some great men who seem to have access to a world from which we ordinary mortals are shut out. Like Moses, they go up into the Mount, and the directions they give us are based upon what they have seen in it. But we cannot go up with them, so we feel that we very imperfectly understand them. For myself, I must admit that I very imperfectly understand Froebel. I am convinced, as I said, that he has pointed out the right road for our advance in education; but he was perhaps right in saying, 'Centuries may yet pass before my view of the human creature as manifested in the child, and of the educational treatment it requires, are universally received.'"

Quick further says, "Such insight as we have we owe to those who have contributed to the science of education." . . . "Among these there are probably no greater names than those of Pestalozzi and Froebel."

I have given this statement from Quick as being the best criticism of Froebel I know. As a seer, he was inspired with the greatness of his vision, and only as we grow in knowledge of and faith in the varities of soul-life, can we partake of his enthusiasm and power.

As very little from human vision but has its imperfection of perception, and very little from human language but imperfectly expresses the truth the mind has received—so Froebel has contributed, all unwittingly, to the work he so loved errors in judgment and in clearness of expression. But these are so apparent to the student, and so insignificant compared to the great value of the ideas he has given us with clearness of thinking and expression, that we need not dwell on them, but turn to consideration of those essentials which constitute his value to education.

Friedrich Wilhelm August Froebel was born in Oberweisbach, a village of the Thuringian Forest, Germany, on April 21, 1782. From the deprivations of his childhood he was able, as an educator, to know the longings and needs of childhood. Inheriting from his mother, whom he lost before he was a year old, an imaginative and artistic temperament; and receiving from his father, though he was a good man, very little tenderness, and from his stepmother often unkind treatment; he had a most lonely childhood, filled with thoughts about the seriousness and unhappiness of adult human living. A biographer tells us (Reminiscences of Froebel, Page 337): "Before he was four years old he lived in a house which was so built that it was under the shadow of a church, and no sunbeams could enter it, and he was kept indoors by the single housemaid who was too busy to see to him otherwise. His great amusement at one time was to watch some workmen from a window, as they were repairing the church, and his impulse was to use what pieces of furniture, or other objects he could move, to imitate them in their building, but he was baffled by their unsuitableness.

"It was the recollection of this ungratified building instinct which suggested to him in later years that children ought to be provided with materials for building

among their playthings. To this recollection was probably due the observation which every one must make who sees much of children, that they all have the building instinct, and 'to make a house' is a universal form of unguided play, if it is only with chairs and tables or whatever is at hand."

When ten years old, his mother's brother took him under his own care, and in this home we are told (Reminiscences of Froebel-Von Bulow), "Amid plenty and kindness, Friedrich throve and prospered for five happy years; went to the high school in the town, and enjoyed for the first time the healthy delight of companionship with others of his own age. In this new life his whole nature expanded; he remained delicate and was somewhat dreamy, but he looked back to this period in after years as to one of great enjoyment. He showed no great aptitude at school except for arithmetic; but he began to be what he never ceased being while he lived—an observer of nature; and in his great delight in watching plants and animals, as well as in his appreciation of companionship, we find the source of two of his strong opinions respecting the education of children. It is to his own retrospective account of his early life, given in later years to his brother Christopher, and on another occasion to a friend, that we owe these particulars, and are able to trace how early his mind received the impression which influenced him so strongly, of the analogy of the human being to the other organisms existing in the world, and the consequent belief that he should grow and develop harmoniously and completely as they do. . . .

"He was put to school by his uncle after he was ten years old. The first day of the school the master gave a familiar sermon upon the text, 'Seek first the kingdom of heaven and its righteousness, and all things shall be added to you.' This was a flash of light to him, and from that time he never lost the clew of the law that was to bring to mankind the happiness of harmony, symbolized by the harmonies and beauty of plants."

"In one of his letters he mentions that in the year when Louis XVI. was beheaded there was a rumor among the peasants of Thuringia that the world was coming to an end. He says he could not share the panic, he did not believe it, for it was plain to him that the will of God had not yet been brought about. What a reflection for a child of eleven years! It foreshadowed the mind that seemed never to forget the past nor the future in its sensibility to the present, but comprehended eternity so far as to feel that this very present God was at once the Ancient of Days and the Redeemer of the future.

"This was the child mind of the man who in his maturity refused to take charge of the education of the Duke of Meiningen's son when it was proffered to him with its emoluments, because, as he explained to the Duke, 'it was impossible to give a sound intellectual education to a child who had not a true moral development, and that it was impossible for a child to recive that, who was separated from equals and led to imagine himself as having a superior nature."

Instead of following the teacher's leading at school, Froebel was always trying to find "the underlying unity in all things," and so being classed as a very dull pupil, he was not allowed to take a university course, and was apprenticed to a forester for two years. Wishing to study natural science that he might understand the workings of laws he felt to be universal, he secured permisson to attend the University of Jena for a year. But limited means and poor management of these means compelled him to leave the university on account of debt. This seemingly aimless dreamer, with ideals for something others could not understand, and not even *he* fully understood, was sent to learn farming; then adrift for three and a half years he was, by turns, a land-surveyor, an accountant, a secretary. But a feeling that he had a mission for humanty was with him, and his vocation came to him in 1805, at the age of 23, when he was given a class to teach in the model school at Frankfort-on-the-Main. We have an account of his satisfaction and happiness at this time in his own words: "The very first time that I found myself before thirty or forty boys I felt thoroughly at home. In fact, I perceived that I had at last found my long-missed life-element, and I wrote to my brother that I was as well pleased as the fish in the water; I was inexpressibly happy."

He had found his mission, the uplifting of humanity by education. Realizing his need of definite instruction regarding educational principles and methods, he visited Yverdon to see the work of Pestalozzi. Later he returned to the Model School to teach. His success was marked, but he felt more keenly than ever his deficiencies in knowledge. After two years of teaching in this school, he engaged in private study, having charge of the education of three boys. Becoming tinctured with the

views of Rousseau he isolated his pupils from the world—but experience soon brought his better judgment into play. Realizing more deeply than ever his own lack in knowledge, he went with his three pupils to Yverdon, that all might have inspiration direct from the fountain head of Pestalozzianism. Here Froebel, with keen intuition, felt alike the strong and the weak points in Pestalozzi's system, realizing it could not give full development to all the powers of the pupil. After leaving Yverdon, he discontinued teaching that he might extend his knowledge by taking a university course at Göttingen.

One writer in comparing Pestalozzi and Froebel says, "Froebel, the pupil of Pestalozzi, and a genius like his master, completed the reformer's system. Taking the results at which Pestalozzi had arrived through the necessities of his position, Froebel developed the ideas involved in them, not by further experience, but by deduction from the nature of man, and thus he attained to the conception of true human development and to the requirements of true education."

To act for the people, even to the extent of offering his life for their welfare, became his self-appointed duty, and we find him serving for the Prussian cause in 1813. As in forestry, he had found an exemplification of his theory of the unity of life, so he found it in the military discipline, where the individual promotes the welfare of all by union with all, in a common cause and under common law—the individual in turn receiving benefit from the benefit of all.

At the close of the war, Froebel became curator of a museum, that he might extend his knowledge and so be better fitted for the vocation of teaching. Then resuming his teaching with three lads as pupils, as one writer tells, "In a peasant's house in Griesheim, and later in the neighboring village of Keilhau, was opened the first school upon that new method which its founder hoped would become the vivifying influence to regenerate the German nation." Here he had the devoted assistance of two disciples, who had served in the war with him, Langethal and Middendorf, and also another disciple, Barop.

The school prospered as to members, suffered as to means of support and was persecuted by envy and misrepresentation. But loyalty and faith held their own, and a like institution was founded in Switzerland. This did not flourish as an institution, but from its recognition by the Swiss government was begun at Burgdorf, Froebel's work of training teachers and his education of little children. This school flourished, there being at one time sixty teachers sent by the Government of Berne for training.

At this time, Froebel wrote his book entitled "Education of Man," which contains his theories regarding life and education. Having been a teacher, he felt that much of the energy of the child, before the regular school age, was, if not misdirected, at least nondirected through lack of systematic guidance in companionship with many others of his own age and abilities, and from this realization came the founding of the kindergarten, a supplement to the mothers' care in the home, and a preparation for the teacher's work in later school work.

The first kindergarten was started in the village of Blankenburg, near Keilhau, in 1840. It influenced educational ideas as an institution till 1844, when it had to be discontinued for lack of funds. Nevertheless, Froebel continued his work of training teachers until his death in 1852. In 1849, he had the good fortune to secure, as a patroness of the kindergarten, a woman of education and means, the Baroness von Marenholz-Bulow. She, hearing of him as an eccentric old man who loved to play with children, viewed his companionship with them, and recognized that his was the purpose of a loving, wise and gifted student of human nature—one of the world's true reformers.

In 1851, the deathblow to Froebel's hopes for the furtherance of his ideas during his lifetime was given by the government's prohibiting the continuance of kindergartens in Prussia. Never did misunderstanding work a greater injustice. Froebel, becoming confused in the mind of the Prussian Government with his nephew Karl Froebel, who as a socialist and atheist wrote articles against government and religion, was accused of heresy to government and to faith. Protests were entered by those who knew Froebel's ideas and hopes, but not till ten years after his death, which occurred in 1852, was the kindergarten reëstablished. This was brought about by Madame Marenholz von Bulow, who secured the rescinding of the prohibitory decree in 1862.

May we not feel thankful the kindergarten has flourished in this land of ours, fulfilling the hopes of its founder, who, as Dr. Hailman tells us, in an essay, "pointed to the United States of America" as the country best fitted by virtue of its spirit of freedom, the true Christianity, and pure

family life, to receive his educational message and to profit thereby?

To consider Froebel's ideas as they affect thought and educational efforts at the present day:

Froebel was preëminently a philosopher, and from his philosophic insight, combined with patient judgment in practically applying this insight to the education of children between the ages of three and six, has come the kindergarten.

As a philosopher he began his first questioning when he sought in his early childhood days for the inner unity of life. He felt that though life seemed composed of contradictions, oppositions, isolations, none such existed as permanencies, but only as processes toward a higher unification. He saw the seeming opposition of nature and man—of physical and spiritual being—of individual as against individual—of individual as against the social whole. As he believed that all creation is from the one God, expressing the nature of the one God, subject to the laws of the one God, so all diversity is only different expressions of the one Life, creating and permeating all creation.

To quote his words: "It is the destiny and life-work of all things . . . to reveal God in their external and transient being. It is the special destiny and life-work of man, as an intelligent and rational being, to become conscious of the divine effluence in him, of his destiny and life-work and to reveal it in his own life with self-determination and freedom." The educational application of the principle of Unity Froebel has made in—

The symbolism of the kindergarten in relation to nature.

The emphasis on development in life of the individual, the emphasis upon the relationship of the individual to the social whole, and upon the dependence of all things on God.

As to the symbolism of nature, Froebel believed that nature is a lower form of life than humanity; and being a form of life, it is subject to the same laws; has strong correspondence in characteristics; has been, in the history of the world, a book to mankind wherein can be read characteristics akin to mankind's own; therefore Froebel knew it could well be used with the child to help him to understand the laws and relationships of his own life. To quote his words: "All nature is a unit in herself, yet but part of a far greater whole. Little by little you may teach your child to know her ways and live in harmony with her; and then, in turn, help him through her, to find those verities within himself of which all outward things are but the type."

In the life of the bird, and of other wild and domesticated animals, Froebel believes the child can see something of his relationship to his parents, their care for himself, and in the playing of the game the sense of this relationship is intensified.

As the child learns that all he sees in creation comes from one God, is protected by God, has only well-being and growth through conforming to the laws of its being to which God has made it subject, so he learns that he, as one of creation, is made by the same God, protected by Him, and must obey as implicitly—consciously as a human being, as well as unconsciously—the laws of his being, physical, mental and spiritual, to which God has made him subject.

A most clear writer on the kindergarten philosophy says, "It is well . . . to remember that Froebel's belief on the subject of 'the symbolism of nature' is not a particular one, but has been shared by many great and devout thinkers—one of the greatest of modern theologians, Rev. F. D. Maurice, repeatedly expressing the thought that sensible things by a *necessity of their own nature,* are constantly testifying to us that which it most concerns us to know of the mysteries of our own life, and of God's relation to us."

Froebel, contrary to the views of the Renaissance period regarding education, held that true education is from within out, the self-activity of the learner being the essential—the office of the teacher being that of a gardener who supplies proper conditions to bring the inner-hidden seed to its full perfection of flowering. With such a belief, Froebel necessarily laid great stress on *development,* and the emphasis which he places upon development in the life of the individual is shown clearly in the following extracts from his book, "The Education of Man":

"We grant space and time to young plants and animals because we know that, in accordance with the laws that live in them, they will develop properly and grow well; young animals and plants are given rest, and arbitrary interference with their growth is avoided, because it is known that the opposite practice would disturb their pure unfolding and sound development; but the young human being is looked upon as a piece of wax, a lump of clay, which man can mold into what he pleases."

"Man, humanity in man, as an external manifestation, should be looked upon not as perfectly developed, not as fixed and

stationary, but as steadily and progresively growing, in a state of ever-living development, ever ascending from one stage of culture to another, toward its aim which partakes of the infinite and eternal."

"In man's entire cultivation it is highly important that his development should proceed continuously from one point, and that this continuous progress be seen and ever guarded. It is highly pernicious to consider the stages of human development—infant, child, boy or girl, youth or maiden, man or woman, old man or matron—as really distinct, and not, as life shows them, in unbroken transitions."

"How different could this be in every respect, if parents were to consider that each successive stage depends on the vigorous, complete, and characteristic development of each and all preceding stages of life!"

"This disregard of the value of earlier, and particularly of the earliest, stages of development with reference to later ones, prepares for the future teacher and educator of the boy difficulties which it will be scarcely possible to overcome. In the first place, the boy so conditioned has also a notion that it is possible for him to do wholly without the instruction and training of the preceding stage of development; in the second place, he is much injured and weakened by having placed before himself at an early period an extraneous aim for imitation and exertion, such as preparation for a certain calling or sphere of activity. The child, the boy, man indeed, should know no other endeavor but to be at every stage of development wholly what this stage calls for. Then will each successive stage spring like a new shoot from a healthy bud; and at each successive stage, he will with the same endeavor again accomplish the requirements of this stage; for only the adequate development of man at each preceding stage can affect and bring about adequate development at each succeeding later stage."

The third application of Froebel's principle of Unity to education which I have mentioned is that of the relationship of the individual to the social whole.

Froebel considered the individual not only as a part of the social whole, but as he termed it, also "member-whole." A member of the whole, and yet partaking of all the essential characteristics of the whole. No material illustration serves well to express this relationship. The idea of organic unity is the best illustration, but it is faulty, for—to take the illustration of the organic unity of the plant—a leaf, though it is a part of the plant, does not partake of the entire nature of the whole plant, though it is affected by and affects the welfare of the whole plant. Froebel's idea of unity as applied to the individual and social whole is higher than that of organic unity.

He considers that each human being has two natures, a selfish nature and a social nature. The selfish nature is isolating; the social nature is that which makes us one with every other being in creation, and as such it is the real and abiding self, the God within each one. This social nature, best termed spiritual nature of feeling and thought and will, constitutes our unity. It is through this spiritual nature, common to all, that (as one writer expresses it) "white men, red men and black men, men of the tropics and men of the poles, may learn to think the same thoughts and obey the same ideals."

Therefore every game that is played in the kindergarten emphasizing the relationship of the individual to society is for the purpose of arousing in the soul of the child a bond of sympathy for human life wherever he touches it, and a knowledge of, and love of living to the highest ideals that humanity has framed in the institutions of family, trade and state.

The fourth application of the principle of unity, that of the dependence of all creation upon God. Froebel shows how, from the child's first questioning as to who made all things to live and grow, and all forces to act, he is learning of God's loving power. The wind in its mystery, the food which nourishes him, the prayer taught in the home, the worship of many in the church, all are used by Froebel, in addition to life with nature, as means of awakening the child's soul to a sense of loving trust in the beneficent omnipotence of God, the Father, of whose nature he partakes.

Froebel has written a book of plays for mothers and children, so true to child-life, so responsive to the needs of mothers, that it has been termed by one deep student of child-life the greatest book for little children and mothers in the world.

A poem from this book will show the character of religious influence Froebel would have the mother give her child:

"What is it, mother, sometimes speaks to me,
Like something dear and sweet I cannot see?
That seems to smile when I am all alone,
With love as kind and gentle as your own?"
"Child, when your mother's face you cannot see,
There is a living presence still with thee;
And when your mother's voice you cannot hear

There still is something whispering in your ear;

"Be good, be glad, be thankful for the love
That never leaves, but smiles from heaven above.
Within thy heart abides that presence bright,
The gift of God to guide my child aright."

In "Education of Man" Froebel tells us, "The life of man shows him to be animated by a spiritual self of his own; that this spiritual self has its origin in a Supreme Being, and depends on this Being, in which all things have their origin, and on which all things depend."

Froebel was not only a philosopher, but he was equally strong as a psychologist, theoretically and practically. From a study of childhood, he saw the characteristic common to all life, that of activity. From Froebel, we learn that "the first utterances of the instinct of activity come without any effort on his (the child's) part." He advises parents thus: "Strengthen and develop this instinct; give to your child the highest he now needs; permit him to add his power to your work so that he may not only gain the consciousness of his power, but learn to appreciate its limitations."

Froebel saw that, in childhood, activity takes mainly the form of play. He tells us, "Play is mainly the highest phase of child development—that a child who plays thoroughly, with self-active determination, perseveringly until physical fatigue forbids, will surely be a thorough determined man, capable of self-sacrifice for the promotion of the welfare of himself and others," and that "the plays of childhood are the germinal leaves of all later life—for the whole man is shown and developed in these, in his tenderest dispositions, in his innermost tendencies."

Froebel saw that in their play children are largely imitative, and, beginning with this common and native characteristic of children in their playing, he has utilized imitation in the kindergarten in perfect accord with the most recent psychological deductions. Miss Blow tells us that most of Froebel's plays are imitative "in the sense that the child either reproduces the activities of persons and things about him or dramatizes and thus relives events in his own history." She also states, "The first form of reproduction is imitation. Hence, imitation is the true point of departure both for educational psychology and a wise nurture of childhood." Froebel uses imitation in his plays as an aid to the child's understanding external conditions and causes and as an aid in his acquisition of language, in the development of his conscience, reason, self-consciousness and originality—all the legitimate outcomes of the use of imitation, in due proportion and at the right time.

As a psychologist of childhood, Froebel is not surpassed by even the most advanced of present-day discoverers. His plays for the cultivation of the child's senses, his comments upon the value of cultivating these as aids in developing correct perceptions and judgment are excellent; his understanding of the value of self-expression, social influence in play, work, and organization is endorsed by the highest authorities regarding child-life. As a philosopher, he is in accord with the sanest and most inspiring reasonings of the deepest thinkers. As a practical thinker, he has shown genius in his contributions to educational methods for little children.

A believer in God and his loving Fatherhood—in humanity as bound together in mutual love and endeavor to be like the Father—he was a man who felt at all times a tenderness for all life, and one who gave unselfishly to humanity, both love and service. As an influence for spiritual living, his personal life and work and his invaluable contribution to childhood and the world of the kindergarten attest his right to be called one of the world's greatest benefactors.

The kindergarten, as the name implies, is for the purpose of aiding the growth of the child in his entire nature—physical, mental and spiritual—according to the laws of his nature. This growth is to be attained under the wise superintendence of a loving, intelligent and trained teacher, and with the companionship of playmates and coworkers of his own age approximately who have therefore like abilities, rights and duties.

The teacher, as a skilled gardener, has aids for the development of the child, and among these are the practical ones of games, stories, songs, science—the geometric forms called the Gifts of the Kindergarten—and the handwork termed Kindergarten Occupations, each of which has its special value.

We have Games in the kindergarten whose object is to direct the child's activity, as in running, skipping, marching. As has been alluded to in this paper, we have also games which help the child to comprehend the life around him, as the activities of animals, his own relationships, and also the experiences of his own life which have most impressed him. Still other games are purely creative ones, the working out of the child's imagination in play. In the nursery the games are often restricted to the playing of one child by himself, and in the kindergarten the greater emphasis is on social games where each child has some

part of acting or singing, and the representations are greatly of activities of life which require the concerted action of many. Games are most important in the child's education, and their value is being appreciated not alone in the kindergarten but grade work also, educationally as well as recreatively.

Stories also have a most important function in the education of the child. In the kindergarten we have stories which reflect the child's own experience—stories which are nature-stories—these being to the little child, as one writer says, the "doorway of natural science." We have stories of the past as of heroes of historic fame, especially of the child's own country; also myths and fairy-tales which have been created by the child-race. All these speak potently to the heart of the child of to-day, causing him to have a sense of the wonderful, and a longing to be powerful and brave, as the hero of whom he hears and tells.

Stories in the kindergarten are told and re-told by kindergartner and children, thus cultivating the power of language-expression; giving permanent knowledge of facts; and best of all arousing the Soul, through the radiance on it of ideals, to a sense of its own duty to obey the whisperings of conscience.

I can well state the value of Song to the little child in the following condensed summary by a writer on the kindergarten: "Froebel urges mothers to sing much themselves; to encourage children to sing, to call their attention to differences of rhythm, to incite them to distinguish between musical tones, and to encourage them to originate little melodies." In the kindergarten the child's musical education is also accomplished by the further use of song, and by the use of rhythm in connection with different movements, as in marching and in games. Most important in education is song—in this soul is aroused and soul is expressed. One writer tells us, "Plato would have us use in the education of young and old alike, only the strain of freedom, the strain of the unfortunate, the strain of courage, and the strain of temperance"—realizing that music noble in sentiment is most powerful to arouse nobility of motive and conduct.

The Science work of the kindergarten lays stress on the life of plant and animal. The child gains knowledge of the life of the plant in its growth from the seed to its flowering; of the qualities of the plant, as it living and intact appeals to the child's sense of sight, touch, and smell. He also learns of the life of wild and domesticated animals, learns to group them by simple but correct classification into their different families, and also learns of the countries where they are native. But beyond knowledge of the life of plant and animal, Froebel places the value of arousing the child's love of the life of plant and animal, and his sense of care for their welfare. He expresses this most clearly in the following words:

> "If to a child's sole care is left
> Something which of that care bereft
> Would quickly pine and fade,
> The joy of nurture he will learn,
> A rich experience, which will turn
> His inner life to aid."

The use of the geometric forms called Gifts gives knowledge of type-forms and division of these forms, and thus is given a preparation for later work in arithmetic, drawing, modeling, and geometry. The use of the gifts by the child, aids development of observation, comparison, memory, judgment—and the power of original creation as the desired aim of all work with the gifts.

The hand-work of the kindergarten consists of twelve Occupations, as planned by Froebel and several others, such as chain-working with papers, Raphia-work, painting which have been found also helpful. The Froebellian occupations are perforating, sewing, drawing, interweaving and interlacing, weaving, folding, cutting, peasework, cardboard, modeling and clay modeling. These Froebellian occupations commence with the making of the point in perforating, then to the line in sewing, drawing, interweaving and interlacing, then the making of the surface in weaving, the modifications of surface in folding and cutting—the bounding of solids in peasework and cardboard medeling—and the making of the solid itself in clay modeling.

The benefit of the Occupations is in the developing of skill of hand, in the gaining by the child of a knowledge of the elements of form and the fundamental colors, in the cultivation of the eye and of creative power in making objects of use and of beauty. They are, therefore, a preparation for later work in industrial and fine arts. As a preparation for industrial arts, each occupation can be adapted to making miniature reproductions of objects of use, as in folding, cutting and sewing of utilitarian objects.

The main object of the Occupations industrially is not to give knowledge of adult industries, but to arouse a proper spirit towards work—to cause close observation on the child's part, to give a perception of the relation of form to use—and to develop the power of imitative, and best of all,

creative adaptation of form to use. These essential values well belong also to the later grade work in manual training, with the added values of greater accuracy being required in the making of objects and the emphasis laid on methods to attain desired results. As a preparation for later work in Fine Arts the kindergarten Occupations lay stress on color combinations, and the spacing of elements of form; as point, line, surface, and the making of solids as in clay.

With the color-work, the colors, red, orange, yellow, green, blue and violet are used with their tints, but not often their shades. These are combined at times with gray, standard and tint and occasionally shade—also with black, white and brown.

In use of form in the kindergarten as a preparation for later fine arts work, the element of the line is used in repetition, and grouping by various combinations of numbers; also by variations in length of lines in repetition, and grouping suggesting perspective; and in the modification of line into objects of nature and manufacture, in repetition, grouping and different sizes of same object and of different objects.

Then we have the spacing of elements of point, line and mass modified into natural objects, as in an evening scene, the point will be the moon, the line modified into the tree, and the mass into the hill. This is done in the kindergarten with material appropriate to the child's skill of hand, as with paper cut by himself into various forms, and then pasted by himself in the one scene so as to cultivate his sense of proper spacing, and proper color combinations. The Occupations cultivate the child's sense of the beautiful by directing him to observation of nature in her combinations of color, and in her beauty of form.

The gifts or geometric forms which have been mentioned are also a preparation for later work in industrial and fine arts by their use in the representing of utilitarian objects according to prescribed measurements and in the making of beauty forms which emphasize symmetry.

These are the tools of the kindergarten. They are that portion of the kindergarten which to the uninitiated and to the superficial kindergartner also, constitute the kindergarten. They are truly as dead matter, unless made alive by heart, mind and soul energy of the kindergarten acting on the child, as the tool of the sculptor not made powerful by his genius. It is necessary that their purpose and modes of use be known thoroughly for the sake of skill; but would we know the kindergarten in its living motive power, we must look to the cause of all endeavor, the child—his harmonious adjustment to the good the world contains, and his character-development, that he may be a contributor to the world's progress—and we must look to the Kindergarten. I shall not speak of the latter except to say the ideal kindergartner has never been found, as her qualities are said to be these: The music of St. Cecilia, the art of Raphael, the dramatic genius of Rachel, the administrative ability of Cromwell, the wisdom of Solomon, the meekness of Moses, and the patience of Job." The child is a wonder and discoverer in this world—a bundle of impulses, good and bad, from human heredity, and a soul waking into consciousness and power from divine heredity—do we not all know him? De we not believe "the hope of the world lies in the children"? And can we as parents and teachers have a greater mission than that of helping these lives to grow to a truer, worthier power and purpose?

MANUAL TRAINING.

THERE were four of the departments announced for 8:30 a. m. on Wednesday morning. Three of them were in session with good attendance. The number of persons in the Manual Training Section was small, and a brief formal meeting was held at which Prof. Edward C. Fitzgerald, of Pittsburg, was elected president, and Supt. Grant Norris, of Braddock, secretary for the ensuing year. . The paper presented was that of Prof. C. B. Connelly, of the Carnegie Technical Schools, of Pittsburg, upon

MANUAL TRAINING AS A PREPARATION FOR A SCIENTIFIC OF ENGINEERING COURSE

After the Civil War great changes were brought about all over the country, especially in the Industrial circles. The spirit and life of the people, their ideas and inspirations, were on an entirely different plan from what it had been in the years preceding the war. And no change is more remarkable than the rapid transformation made by schools of Applied Science and Technology. The industrial development had reached the limit of its practicability unless the industrial enterprises were organized and directed with more scientific knowldege and skill. Hence we have the Science and Technical School steadily coming to the front—preparing men to do special lines of work. They study fundamental principles, compare experiences of

others, and with this for a foundation, go forth to their own practical experience and, if they are progressive, add to the information gained by predecessors.

Some one has said—"An engineering course is primarily and principally an educational and not an engineering problem." The earlier the age at which conceptions are acquired the more freely and forcefully they will be used in later life. Every instructor will admit that there is high value in early familiarity with the subjects of study. It is for this reason that I say Manual Training is a good preparation for a scientific or engineering course. It would be a poor student of English or mathematics who did not begin to study alphabet or number until he was sixteen or eighteen years of age, and he in fact does not acquire the alphabet of science if no Manual Training is taught in the public school grades. A child of grammar school years is just as capable of understanding the principle of the lever as some of his seniors in college. And a child of the same age can appreciate the principle of an arch, and absorb the reasoning of perspective. The advantage to a boy taught these things is of a value only to be realized by himself as he develops and works on his special course.

The mechanical drawing and shop work not only gives knowledge of utensils, size and use, value and care of tools; but promotes accuracy, neatness, watchfulness of detail, and dexterity, all of which are required in the manipulation and study of a science. The tools are the only text-books used and the test of scholarship is in their intelligent manipulation. "To realize the potency of man it is only necessary to contrast the two states of man—the one without tools and the other with tools." The power to observe and create is developed by the steady upward trend of the work. The subject is suggested, the essentials analyzed and a form built upon them, the mental picture conveyed by means of drawing. By such processes the construction becomes an embodied thought and the child, without realizing it, becomes creative.

"Real Manual Training is not a matter of simply doing different things." Some of the results of such a course are:

1. Quick and clear observation, careful and just reflection, the instructive habit of deciding promptly cause and effect.

2. The different school curricula of today give preference to the elementary geometry, physics and mechanics over and above the traditional grammar school studies.

3. And the chief argument for the early acquirement of these elements is the invaluable preparation for the study of higher mathematics, physics and applied mechanics in later years.

Long practice brings accuracy, accuracy of thought as well as execution, and this takes time. It is difficult to obtain accurate manipulation in Laboratory work the first time an experiment is performed, yet it is rarely possible to repeat an exercise. The pupil needs to see the subject from as many sides as possible, to think it over, to live with it, in order to solve problems involving the principle.

Comenius thought that life would have to be lengthened to give time to acquire all knowledge. The idea that any one person can possess all knowledge has long since been abandoned and I am not going to revive it now. But to start a pupil so early in life with the matter presented in a way that is attractive, and that can be comprehended and absorbed by the child so that he will make it a part of himself, is preparing him so that he will not be able to recall the date when he did not fully understand each principle, though he might not have known its technical name.

During their early existence the various scientific or technical schools had to accept such students as they could procure, and those variously prepared. However the establishment of such schools naturally called for the preparatory work and this was recognized and followed in due time. Now we are trying to adjust this preparation in the school curriculum where it will prove itself worthy and of use.

A vast majority of boys do not get beyond the high school, or even the grammar school, with their education. Now we say, if a boy has had systematic training through all the grades and does the advanced work in the high school, even if he stops with the grammar school he has a good foundation for work to be spent specially upon Applied Science.

Manual Training gives the boy such familiarity with the details that a care for little things is developed. It also prevents the ridiculous lack of common sense displayed by some men of learning. In the early history of the technical school, students entered without any knowledge of either drawing or constructive tools. As a consequence they spent a large proportion of their time learning elementary drawing, and, if they had work in science or mechanics, they either bungled excessively in attempts to execute work for which they were not fitted or spent time on preparatory work. They wasted time doing elemen-

tary work, now covered by the elements of shop work and mechanical draughting as taught in the public schools. However, a Manual Training school is not a technical school. I do not want to convey that impression.

A technically trained man should be well versed in the theory and practice of some branch of Applied Science. He is a professional man. More manual training graduates choose the professional career in preference to that of an every-day mechanic, and they are found to be characterized by clear-thinking and a fondness for severe student work. The elements are taught in the manual training course. The boy becomes an adept in the handling of the square, triangles, drawing pen and brush. And this also requires accuracy, clearness and finish.

The Manual Training idea for our public school children which has taken such a deep hold on the minds of thinking people is not a sudden growth, but has developed naturally from the pressure caused by the social and industrial conditions and the educational demands of our time. Our age is extremely practical, and what is considered practical appeals to men, hence Manual Training as conducted in our public schools to-day is very popular and is growing more so each succeeding year. Its place in the curriculum of the elementary school is only as an element of general training and stands side by side with the other studies.

Technical schools are the stimulation of commerce and industry. Where skill is developed there is less ignorance. And the less the ignorance and the greater the skill the greater the amount of material consumed and the more rapid and steady the demand for it. Our technical schools gather in a class of students that exercise brain power of a high order and are able to compete with classical students. We find the the bachelor of science equivalent to the bachelor of arts. The majority of the people of any land are workers; and it is now recognized that a broader training in this direction is absolutely essential, and a demand is made for it in the public school system.

After all, Manual Training is the means and not the end. The Technical School schould in some measure recognize the need, and realize that the brilliant future before it is to be supplemented by the prosperity of the Manual Training School.

OFFICIAL DEPARTMENT.

DEPARTMENT PUBLIC INSTRUCTION,
HARRISBURG, September, 1907.

AN error, which was not discovered until the blanks were sent out, was made in printing blanks (Forms Nos. 41, 43) for affidavit under the minimum salary Act. It occurs on the second page, at the beginning of one next the last line in the affidavit; it is printed "June, 1907," when it should be June, 1906. The date should be changed to 1906 before the affidavit is executed.

MINIMUM SALARY, ETC.

To Boards of School Directors:

On June 15, 1907, Governor Stuart approved the increase in the school appropriation to fifteen million dollars for the two years beginning June, 1907, and ending June, 1909. Of this amount two hundred seventy-five thousand dollars were set apart in aid of township high schools and an equal amount in aid of borough high schools.

Out of the increased appropriation there is to be paid the increase in teachers' salaries provided for in the minimum salary act of May 31, 1907. This act provides in section 1 that "the salary of common school teachers in districts of this Commonwealth receiving State appropriation shall be no less than fifty dollars per month in all cases where the teacher holds a professional, permanent or normal school certificate, and has had two years' practice and presents a certificate of proficiency in said practice for said time from the superintendent in charge of said teacher." The act further provides in section 2 that "the minimum salary shall be forty dollars for all teachers holding certificates of less grade than required under section 1 of this act, and that the State shall pay the amount of increase in all salaries that are provided for under this act and over the amount of salary paid in each school district in this Commonwealth in 1906, and said increase shall be paid out of the increased appropriation to common schools."

Section 3 provides that "the president and secretary of school districts, where the prescribed salary is greater than that paid for the school year beginning June, 1906, shall certify under oath to the State Superintendent of Public Instruction on blanks prepared by him the number of teachers with the salary paid to each in 1906; the number of teachers with the salary paid to each for the year for which the report is made; also the number of months in the school term for said year. In order that any district may participate in this additional

appropriation, *its report must be on file in the Department of Public Instruction on or before the first Monday of October, 1907, and at the same time annually thereafter."*

School appropriations can not be paid before the end of the year for which they have been made. In other words, districts are not entitled to a share of the school appropriation unless they comply with the Acts of Assembly fixing the minimum term, the minimum salary, the scholarship of those who teach and other requirements specified in the school laws. Hence, although the minimum salary goes into effect in June, 1907, the first payment of school appropriation under this act can not be made before June, 1908. The same is true of the appropriation in aid of borough high schools made by the legislature of 1907.

It is evident, from the first section of the act, that districts which fail to comply with the minimum salary requirement will forfeit their share of the State appropriation for public schools.

Very respectfully,
NATHAN C. SCHAEFFER,
Supt. Public Instruction.

ENTRANCE OF BEGINNERS.

An Act regulating the entrance of beginners into the public schools of Pennsylvania.

Section 1. Be it enacted, etc., That from and after the passage of this act, it shall be lawful for school boards to confine the entrance of beginners into the public schools to certain periods, of not less than one week each, in the course of the school year: Provided, however, That at least two such periods shall be fixed upon, and that beginners becoming six years of age in the interval between any two periods shall have permission to enter within the period immediately preceding such interval. For the purpose of this act, the word "beginner" shall mean any child of school-age that cannot read and write.

Approved May 31, 1907.

TEACHERS' COUNTY INSTITUTE.

The following are dates and places at which the teachers' annual county and city institutes will be held for the year 1907.

Allegheny	Pittsburg	Aug. 26.
Erie	Erie City	Aug. 26.
Lackawanna	Scranton	Sept. 30.
Bradford	Towanda	Oct. 7.
Lawrence	New Castle	Oct. 7.
Mercer	Mercer	Oct. 7.
Lehigh	Allentown	Oct. 14.
Cameron	Emporium	Oct. 21.
Greene	Waynesburg	Oct. 21.
Lebanon	Lebanon	Oct. 21.
Northampton	Easton	Oct. 21.
Susquehanna	Montrose	Oct. 21.
Warren	Warren	Oct. 21.
Berks	Reading	Oct. 28.
Bucks	Doylestown	Oct. 28.
Carbon	Mauch Chunk	Oct. 28.
Delaware	Media	Oct. 28.
Huntingdon	Huntingdon	Oct. 28.
Luzerne	Wilkes-Barre	Oct. 28.
McKean	Smethport	Oct. 28.
Montgomery	Norristown	Oct. 28.
Pike	Matamoras	Oct. 28.
Potter		Oct. 28.
Chester	West Chester	Nov. 4.
Tioga	Wellsboro	Nov. 4.
Cambria	Ebensburg	Nov. 11.
Lancaster	Lancaster	Nov. 11.
Monroe	Stroudsburg	Nov. 11.
Wayne	Honesdale	Nov. 11.
Centre	Bellefonte	Nov. 18.
Dauphin	Harrisburg	Nov. 18.
Franklin	Chambersburg	Nov. 18.
Adams	Gettysburg	Nov. 25.
Juniata	Mifflintown	Nov. 25.
Mifflin	Lewistown	Nov. 25.
Somerset	Somerset	Nov. 25.
York	York	Nov. 25.
Columbia	Bloomsburg	Dec. 2.
Cumberland	Carlisle	Dec. 2.
Elk	Ridgway	Dec. 2.
Fulton	McConnellsburg	Dec. 2.
Montour	Danville	Dec. 2.
Perry	New Bloomfield	Dec. 2.
Snyder	Middleburg	Dec. 2.
Blair	Hollidaysburg	Dec. 9.
Lycoming	Muncy	Dec. 9.
Wyoming	Tunkhannock	Dec. 9.
Bedford	Bedford	Dec. 16.
Butler	Butler	Dec. 16.
Clarion	Clarion	Dec. 16.
Clearfield	Clearfield	Dec. 16.
Clinton	Lock Haven	Dec. 16.
Fayette	Uniontown	Dec. 16.
Forest	Tionesta	Dec. 16.
Indiana	Indiana	Dec. 16.
Jefferson	Brookville	Dec. 16.
Northumberland	Sunbury	Dec. 16.
Schuylkill	Pottsville	Dec. 16.
Venango	Franklin	Dec. 16.
Washington	Washington	Dec. 16.
Westmoreland	Greensburg	Dec. 16.
Armstrong	Kittanning	Dec. 30.
Beaver	Beaver Falls	Dec. 30.
Crawford	Meadville	Dec. 30.
Sullivan	Dushore	Dec. 30.
Union	Lewisburg	Dec. 30.

CITY ANNUAL INSTITUTES.

Williamsport	Aug. 26.
Johnstown	Aug. 28, 29, 30.
Allentown	Sept. 2.
Harrisburg	Sept. 2.
Reading	Sept. 2.
Wilkes-Barre	Sept. 2.
McKeesport	Nov. 25.
Carbondale	Dec. 30.
Scranton	

Each of the following will hold Institutes at different dates during the term: Allegheny City, Altoona, Chester City, Hazleton, Lancaster City, and Pittsburg.